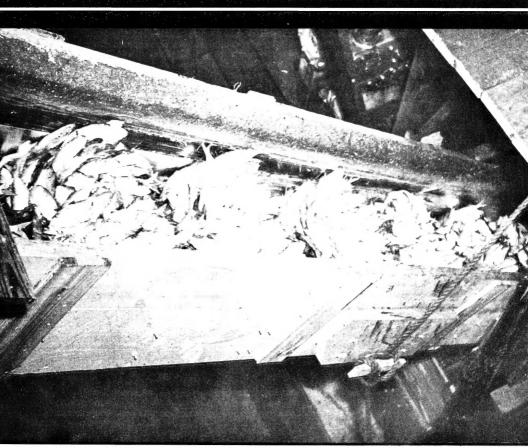




COMMERCIAL DEVIEW FISHERIES ILL



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FISH and WILDLIFE SERVICE United States Department of the Interior Washington, D.C.

JOHN L. FARLEY, DIRECTOR



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor H. M. Bearse, Assistant Editor

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REDUCTION OF CURD IN CANNED SALMON PREPARED FROM FROZEN FISH

Part II - Effect of pH and Salt Content

By Harry L. Seagran*

ABSTRACT

The liquid-binding power of fish muscle is influenced by salt content and pH and exhibits a zone of minimum effect corresponding to the "isoelectric zone" (approximately pH 5 to 6) of fish-muscle proteins. The retention of fluid on heat processing, with corresponding curd reduction, was shown to depend upon the liquid-binding power of the proteins at approximately pH 6,5 and above in the presence of about 2- to 5-percent salt in the meat. These findings do not support the hypothesis that the reduction of curd formed during the heat processing of brined meat (prepared from frozen fish) is due to a dissolving action of brine on the meat proteins.

INTRODUCTION

Chief among the undesirable characteristics of canned salmon prepared from thawed fish is a surface curd formation as a result of the heat coagulation of soluble protein released during heat processing. It has been observed that treatment of the thawed meat, prior to heat processing, with 70-percent saturated brine for 10 min-

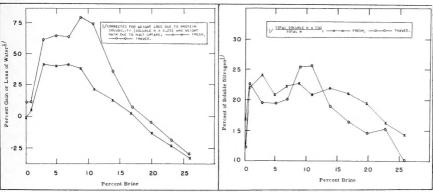


Fig. 1A - Effect of brine concentration on the imbibition of water by fresh and thawed king salmon slices.

Fig. 1B - Effect of brine concentration on protein solubility of fresh and thawed king salmon slices.

utes is partially effective in reducing curd (Dassow and Craven 1955). Tanikawa et al. (1952) have proposed that the reduction of curd formed during the heat proccessing of brine fish meat is due to a dissolving action of brine on the meat proteins, and these authors have suggested, for the prevention of curd, as complete a removal of soluble proteins from the surface of the meat as possible.

^{*} Biochemist, Fisheries Experimental Commission of Alaska, Fishery Products Laboratory, Ketchikan, Alaska.

It is well known, however, that brine treatment of the meat prior to freezing or after thawing markedly reduces drip and that this treatment is thus quite effective in preventing the excessive loss of soluble protein. Tarr (1942) has demonstrated that the prevention of drip occasioned by lightly brining fresh and thawed fishmuscle at its natural pH is due largely to the ability of NaCl to cause the proteins to bind liquid firmly. Tarr also reports that halibut muscle swells gradually in dilute HCL or NaOH solution, the swelling in acid being almost entirely inhibited by NaCl and that in alkaline solution greatly increased thereby.

In an attempt to explain the effect of brine on fish meat in reducing drip and the curd resulting from heat processing, the general proposals of Tanikawa et al. and Tarr of protein solubility and protein swelling in brine have been considered in the present brining studies.

EXPERIMENTAL

EFFECT OF NaCl CONCENTRATION ON PROTEIN SOLUBILITY, IMBIBITION, AND CURD REDUCTION: Both fresh and thawed-frozen red king salmon (Oncorhynchus tschawytscha) were used. (Prior to the tests, the frozen salmon were held in storage at -20° F. for 3 weeks.)

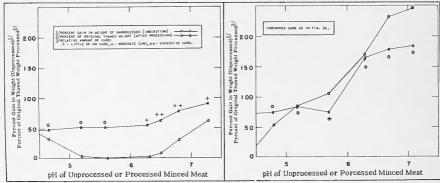


Fig. 2A - Effect of pH(without added NaCl) on imbibition. 1/2 and liquid retention. 2/and curd reduction 3/(after processing), of thawed minced red king salmon meat.

Fig. 2B - Effect of pH and NaCl (3 percent) on imbibition 1/2 and liquid retention 2/2 and curd reduction 3/2 (after processing), of thawed, minced red king salmon meat.

<u>Procedure</u>: Thin slices of the fresh and of the thawed-frozen salmon meat about 1/2-inch in thickness and 4 square inches in total surface area (including both sides of the piece) were weighed and then immersed for 16 hours at 68° F. in 100-ml. brine solutions ranging in salt concentration from 0 to 26 percent by weight. No adjustment of the natural pH was made. Loss or gain of weight was measured by weighing the blotted slices. Determinations for total soluble nitrogen (Ma and Zuazaga 1942) were carried out on aliquots of the filtered resultant brines. NaCl content was determined by a modified method of the Association of Official Agricultural Chemists (1950) on sections of the brined fish meat. A portion of each slice of brined meat was heated for 2 minutes at 450° F. in an air-oven along with unbrined controls to determine the respective effects of the brine on curd formation.

Results and Discussion: Immersing the thawed-frozen meat in brine reduced curd formation only if the brine was of certain concentrations (table). If the concentrations were between 1 and 5 percent there was little or no curd formation. Above these concentrations, there was an increasing tendency for the meat to lose imbibed water on heating (with resulting formation of curd) up to a maximum at about

17 to 20 percent brine concentration. Above this level, increasing dehydration of the fish meat occurred with resulting protein denaturation, and little curd was observed on heating. The attainment of equilibrium between meat and water was not demonstrated, however, and the dehydration effect beyond the point of maximum im-

bibition may not have reached completion (Fougere 1952).

The fresh tissue showed no significant curd on heating, regardless of the NaCl concentration (table).

Relationship of Brine Concentration to Curd Formation										on			
on Fresh and Thawed King Salmon Slices													
Immersed in Brine and Then Heated													
	Amount 1/ Amount of Curd on Brined Slices						5						
Sample	of Curd on	Brine ConcentrationsPercent					t						
	Control	0	1	3	5	7	9	11	14	17	20	23	26
Fresh 0 0 0 0 0 0 0 0 0 0 0 0 0							0	0					
Thawed	+	0	0	0	+	+	+	++	++	++	0	0	
1/0 - little or none; + - moderate; ++ - excessive													

The tests for imbibition (fig. 1A) and solubility (fig. 1B) were interesting in that the frozen tissue showed a much greater inbibing power than the fresh tissue (Tarr 1942), maximum imbibition occurring at the point of maximum solubility for the protein of the thawed tissue. Except at this point (about 10-percent brine) the thawed tissue essentially showed a slightly lower solubility than the fresh (Snow 1950).

The relatively poor curd prevention in the region of maximum solubility of the protein of the thawed meat would not seem to indicate an obvious relationship between leaching effects of the brine and curd reduction as proposed by Tanikawa et al. (1952). In addition, the curd prevention at high NaCl concentrations, where protein solubility is at a minimum, is due to a dehydrating effect rather than to a leaching effect.

The fact that king-salmon meat shows an imbibition maximum at about 10-percent NaCl is in agreement with the findings of Fougère (1952) and Duerr and Dyer (1952), who used cod muscle. The latter authors showed that it is the actomyosin fraction that undergoes denaturation above this NaCl concentration.

EFFECT OF pH AND NaCl ON IMBIBITION AND CURD REDUCTION: On the basis of the retention of imbibed liquid and the resulting curd prevention for the tissue slices immersed in about 1- to 5-percent brine, where the imbibition potential was very strong, a number of experimental studies with and without 3-percent brine at various pH levels were carried out on frozen red king-salmon meat that had been stored 9 months at -5° F. then thawed and minced.

<u>Procedure:</u> A typical experiment was carried out as follows: A series of 40 g. of the thawed minced meat per 200 ml. of water or 3-percent brine at adjusted pH levels (pH adjusted with dilute HCl or NaOH) was held in 250-ml. centrifuge bottles for 16 hours at 36° F. The suspensions were centrifuged at 2,000 r.p.m. for 20 minutes, the supernatant liquid was decanted, and the change in weight due to this treatment was noted. The resultant meat was transferred to $\frac{1}{2}$ -pound flat cans, and the sealed cans were processed at 10- to 12-pounds pressure for 40 minutes. The processed cakes were drained, reweighed, and inspected for curd. The final pH of the entire processed contents of the can was then recorded.

Results and Discussion: These experiments indicated that in the absence of NaCl (fig. 2A) there was minimum imbibition from about pH 5.2 to 6.3. Above pH 6.5 and below pH 5 imbibition increased strongly. At approximately pH 5.5 and below there was no curd on heat processing; above this point curd was present and particularly heavy in the region of about pH 6.5 to 7.

In the presence of 3-percent brine (fig. 2B), imbibition was at a minimum below pH 5, becoming quite strong between pH 5 and 6, and very strong from pH 6 to at least 7.1. On heat processing there was no curd below pH 5, and there was mod-

erate curd intermediate between pH 5 and 6. In the range of approximately pH 6.5 to at least pH 7.1, there was a complete lack of curd. In addition, the presence of 3-percent brine at approximately pH 6.5 and above greatly increased the ability of the meat to retain imbibed liquid on processing, liquid retention being closely related to curd prevention.

Thus, the retention of extra-cellular fluids or drip is related to the power of the proteins to imbibe free liquid. This imbibing power of muscle proteins is influenced by salt content and pH and exhibits a zone of minimum effect corresponding to the "isoelectric zone" (approximately pH 5 to 6) of fish muscle proteins (Tarr 1942). The retention of fluid on processing, with corresponding curd reduction, depends upon the liquid-binding power of the proteins at approximately pH 6.5 and above, occasioned by the presence of about 2 to 5 percent salt in the meat.

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DO YOU KNOW THAT

An 80-year old Norwegian fishermen of Kjelvik in Finnmark Province in the spring of 1954 caught a halibut weighing 154 pounds. He rowed $1\frac{1}{2}$ hours to Honningsvaag to sell his catch.

-- News of Norway, May 27, 1954.

UTILIZATION OF SEA LIONS IN ALASKA

By John A. Dassow*

During the past year, there has been new interest shown in the possibility of commercially utilizing the Steller sea lion, which occurs in large numbers in Alaska coastal waters. Some of this interest arises from the demand for an economical meat, with high-protein and low-fat content, for use as either fur-farm or fish-hatchery feed in the Midwestern and Western states.

STELLER SEA LION

General information on the Steller sea lion is given in the following excerpt from the publication, "The Seals, Sea Lions, and Sea Otter of the Pacific Coast," by Karl W. Kenyon and Victor B. Scheffer, Wildlife Leaflet No. 344, U. S. Fish and Wildlife Service (February 1953).

"The Steller sea lion is the largest of all eared seals. Because of its massive size and 'belligerent' nature, it is seldom seen in zoos and is never trained. It is

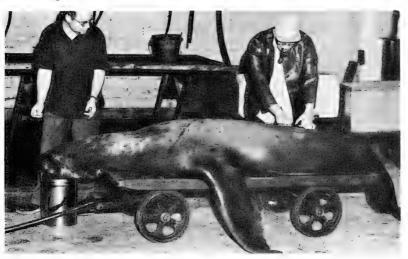


Fig. 1 - Measuring sea lion shot in Tongass Narrows--male, weight 800 pounds.

well known to fishermen through its habit of robbing fish from nets, traps, and lines and because it gathers nearestuaries to feed during salmon and herring runs. It is named for Georg Wilhelm Steller, the naturalist who accompanied the discovery expedition to Alaska in 1741.

<u>DESCRIPTION</u>: "The adult male weighs up to 2,200 pounds and the female up to 1,000 pounds. At birth, the pup weighs about 35 pounds and is a rich chocolate brown. Within a few months it takes on the buff or yellowish-tan coat of the adult. The large size, light color, and heavy muzzle and head are the best recognition characteristics of the adults. The young of less than a year may easily be confused with the fur seal and California sea lion.

*Chief, Fishery Products Laboratory, Ketchikan, Alaska, operated jointly by the Branch of Commercial Fisherics, U. S. Fish and Wildlife Service and the Fisheries Experimental Commission in Alaska.

"The adult voice is a prolonged, deep-throated, bellowing roar; the male's somewhat lower than the female's. Both make, in addition, coughing and grunting sounds. The pup utters a feeble, prolonged grunt."

RANGE: "The Steller sea lion ranges from the islands of southern California northward along the coast into Bering Sea. The population is roughly estimated at: California 3,000; Oregon 1,000; Washington 500; British Columbia 10,000; Alaska 40,000; total about 60,000. This sea lion is usually found at sea, very rarely in bays."

BREEDING HABITS: "It breeds throughout most of its range. During June and early July the sea lions resort to favorite wave-beaten rocks and islets. Here the male holds a harem of 10 to 20 females. The cow bears a single pup and is bred before she is allowed to return to the sea to feed. The pup lives on mother's milk for at least three months. It does not take to the water for several weeks after birth, although, like the fur-seal pup, it is able to swim weakly from the moment it is born."



Fig. 2 - Butchering sea lion shot in Tongass Narrows -- male, weight 800 pounds.

FEEDING HABITS: "Few Steller sea lion stomachs have been analyzed. Many more are needed as evidence of the year-round diet. During salmon and herring runs, sea lions gather in straits and at river mouths to feed. Sight observations, however, may be misleading. The stomach of a sea lion killed near the mouth of the Klamath River during a salmon run contained no salmon, but it was packed with lampreys, fish which prey extensively on salmon. Other sea lions, killed in and near fish traps, contained salmon. Yet, during much of the year, sea lions feed where no commercially-valuable fish are present. The contents of approximately 50 stomachs containing food revealed a diet of squid, sand lances, pollock, flounders, sculpin, cod, herring, small sharks, skates, perch, and various other scrap fishes; with small amounts of salmon, halibut, and sablefish."

"Many more sea lion stomachs are needed before conclusions can be drawn as to the over-all damage to the food-fish industry. Fishermen should save sea lion stomachs, either frozen or pickled in formalin, for analysis, with information as to when, where, and by whom they were taken. For further details, consult your local fishery agencies."

"Vigorous statements of the damage inflicted by sea lions to fishing are often heard. No doubt exists that in certain areas sea lions interfere materially with fishing activities. However, before any control measures can be effectively taken, fishermen should present evidence consisting of exact locations, dates, the number of animals involved and, whenever possible, the stomachs of sea lions killed. Without this specific information, a sea lion control program might represent time and money wasted, since large numbers of sea lions exist where no fishing is carried on. In order to be effective, a control program must be concentrated where damage to fishing and fisheries occurs."

REGULATIONS

The Fish and Wildlife Service regulations pertaining to sea lions are of interest to anyone planning their utilization. Under the Code of Federal Regulations (Title 50 Chapter 1-G), Part 142, "Protection of Alaska Sea Lions," was amended by the Secretary of the Interior on April 7, 1949, as follows:

"AUTHORITY: This amendment is issued pursuant to the Act of June 16, 1934 (48 Stat. 976; 16 U.S.C. 659).

"Basis and Purposes: On the basis of widespread complaints from fishermen, information produced at public hearings, written briefs submitted by members of the fishing industry, observations by personnel of the Fish and Wildlife Service, and a scientific investigation described in Special Scientific Report No. 28 of the Fish and Wildlife Service, it has been determined that sea lions occur in excessive numbers in the waters of Alaska and are inflicting serious economic loss on the fisheries. The protection of the herd at Bogaslof Island will prevent the extinction of this animal as a species of interesting sea life in such manner as will not be detrimental to the Alaskan commercial fisheries. Accordingly, to reduce the abundance of sea lions, the following provision is adopted, to become effective 30 days after its publication in the Federal Register.

"Section 142.1 is amended to read as follows:

"s 142.1 <u>Killing of sea lions</u>. The killing of sea lions in the Territory of Alaska, or in any of the waters of Alaska over which the United States has jurisdiction is permitted, except on Bogaslof Island and within one statute mile of the shores of Bogaslof Island."

EVALUATION OF POSSIBILITIES FOR UTILIZATION

For study of utilization possibilities, the Service's Alaska Fishery Products Laboratory obtained during November 1954 to January 1955 four specimens of the Steller sea lion from local groups in Tongass Narrows (adjacent to Ketchikan). The proximate composition of samples of meat, liver, and blubber from each animal was determined and is summarized in table. In taking samples of the meat, the blubber (fat) was trimmed carefully in order that only lean meat was analyzed. Both meat and liver were found to be high in protein (20 to 24 percent) and fairly low in oil (1 to 4 percent). The protein content compares favorably with that for horse meat and lean whale meat, both of which are used extensively in animal feeds. The liver was found to be approximately 3 percent of the total weight of the animal. Based on 2.8 percent-oil content, one sample of liver assayed 302,000 spectrophotometer units of vitamin A per pound, or 23,800 units vitamin A per gram of oil.

Both the sealion meat and liver were found to be an acceptable human food; however, taste tests at the Laboratory and trials by staff personnel at home have shown that appetite appeal is lacking once the novelty wears off. Probably part of this is a matter of esthetic appeal. The meat is dark red and dense, being most acceptable

as a pot roast, as ground meat in burgers, or as meat balls with spaghetti. The liver is coarser and less tender than beef liver but of good flavor. It would not appear that there would be any market for sea lion meat and liver as food for humans, outside of emergency rations or as a low-cost protein food in foreign feeding programs.

Although no laboratory feeding tests have been made, sea lion meat seems to have considerable appetite appeal for cats and dogs, judging from comments of a a half-dozen local residents using it for pet feeding. The liver is equally acceptable. This suggests the possibility of marketing the frozen meat and liver in 1-pound waxed cartons for pet food.

Proximate Composition of Components of Sea Lions Obtained November 11, 1954, December 6, 1954, January 9, 1955, and January 12, 1955, near Ketchikan, Alaska

	T	Moisture	Oil	Protein	Ash	
Sample	Component	Percent by Weight				
Sea lion No. 1 Male (Weight 800 lbs.)	Blubber Liver Meat	20.1 74.2 74.3	$\frac{2}{73.4}$ $\frac{2.8}{2.6}$	5.5 20.8 23.0	.2 1.1 1.1	
Sea lion No. 2 Male (Est. weight 1,000 lbs.)	Blubber	16.5	77.6	4.4	.2	
	Liver	71.9	4.2	20.4	1.1	
	Meat	75,0	1.4	23.8	1.1	
Sea lion No. 3	Blubber	11.9	83.9	4.2	.2	
Female	Liver	74.1	3.5	19.4	1.1	
(Weight 654 lbs.)	Meat	73.6	1.4	24.5	1.1	
Sea lion No. 4 Male (Est. weight 800 lbs.)	Blubber	14.0	78.7	4.8	.2	
	Liver	72.8	3.4	21.0	1.1	
	Meat	74.0	2.1	23.0	1.3	

1/ Analyses were made according to the methods of the Association of Official Agricultural Chemists, 1950. Each value reported is the average of one set of duplicate analyses. Analyses by John L. Iverson, Fisheries Experimental Commission, Fishery Products Laboratory, Ketchikan, Alaska.

2/ The analysis of this sample of sea lion blubber oil showed the following characteristics:

Note: Comparative data for protein and fat content of horse meat and whalemeat: Horse meat: protein 15 percent; fat 3 percent; Whale meat, lean; protein 20 percent; fat 4 percent.

(From Food Composition Tables for International Use, Nutritional Studies No. 11, Food and Agriculture Organization, Rome Italy, March 1954),

The only information available indicates that sea lion meat is good feed for ranch fur animals, provided that excess blubber is carefully trimmed to produce a low-fat content. Controlled feeding tests would certainly be desirable before large quantities are obtained for such use. The acceptance of whale meat for fur-farm feeding would seem to indicate that sea lion meat also would be acceptable, $\underline{1}/$

Another market would be as trout or salmon feed in Federal and state hatcheries. Previous surveys (1952) by this Laboratory have shown considerable need for low-cost protein feeds in fish hatcheries as a substitute for liver and horse meat, which are in limited supply and scarce on occasion. Preliminary inquiry indicates considerable interest by hatchery operators in obtaining sea lion meat at a price competitive to other feeding materials.

In regard to utilizing the balance of the sea lion carcass (the hide, viscera, bones, blubber, etc.), possibilities are present but look rather slim. The hides on tanning produce a heavy-bodied leather which can be split to make a soft durable 1/ According to the "Fishery Products Report S-226" of November 22, 1954, Market News Service, U, S, Fish and Wildlife Service, Seattle, Wash., imports of Norwegian whale meat entering the United States increased from 60,000 pounds in 1952 to more than 2,000,000 pounds in 1954 to was used for animal feed, especially mink,

leather suitable for leather specialty goods--belts, handbags, jackets, and other tourist items. We have been advised on several occasions by large tanners that sea lion leather is of no commercial value because the hides have too many defects, e.g., scars and cuts. Apparently this would be no deterrent for specialty goods and tourist items which could be sold in Alaska,

Reduction of the blubber, bones, viscera, and remaining carcass to meal and oil would be practical in Alaska if (1) large quantities could be obtained--50 to 100 tons per day, for example and (2) carcasses could economically be hauled to a central reduction plant now operating. Both of these possibilities are rather slim. In the table data are given for the analysis of one sample of blubber oil as an indication of its characteristics for industrial purposes.

It is possible, of course, that a small floater reduction plant might combine operations with a refrigerated vessel which would freeze the meat and liver. The economics of this would have to be carefully studied. If existing equipment were available and idle and could be outfitted with no great investment, a trial operation might be worthwhile. The great rookeries of Southeastern Alaska, Kodiak Island, or the Alaska Peninsula would probably be good bases for a summer operation.

In conclusion, there appear to be several major problems in considering utilization of sea lions:

- Lack of definite information on numbers and availability of animals at central locations.
- (2) Economics and practical aspects of slaughter and recovery of the large animals, either in open water adjacent to rookeries or on the rookeries.
- (3) Economics of meat recovery. Estimated lean-meat recovery not over 40 to 50 percent of carcass. Necessity of trimming blubber to produce a low-fat product for animal feed.
- (4) Probable necessity of using refrigerated vessel and floater reduction plant for recovering and processing, since summer herds of sea lions school in fairly isolated waters and rookeries some distance from existing cold-storage and reduction plants.
- (5) Problem of hide disposal. Leather not suitable for most industrial purposes; possibility of marketing in leather specialty goods.

The most economical operation would be one in which the entire animal could be utilized, enabling the operational costs to be deducted from several products rather than one. The preparation of frozen lean meat for animal feed, the reduction of the remaining carcass to meal and oil, and the preservation and later tanning of hides for the leather specialty market appear to be the most promising possibilities at present.

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SOME FACTORS AFFECTING FLUID LOSS IN SOUTHERN OYSTERS 1/

By Milton Fingerman* and Laurence D. Fairbanks*

BACKGROUND

The conditions under which fluid loss (bleeding) occurs in the Southern oyster (Crassostrea virginica) have been investigated. The quantity of fluid lost from shucked oysters was first determined. These preliminary experiments led into more complicated experiments in which the changes in the salinities of the body fluids of oysters which were maintained in water with different salt concentrations were determined.

EFFECT OF SHUCKING METHOD ON FLUID LOSS

The fact that commercially-shucked oysters lose a large volume of fluid is common information. Consequently, experiments were designed to determine the

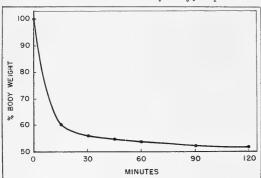


Fig. 1 - The weight changes of the body of oysters after shucking. The mantle and pericardium were intentionally ruptured during the shucking process.

amount of fluid lost from oysters after shucking. Oysters which had been removed from their shells in a manner that ruptured the underlying tissues lost 50 percent of their original body weight as fluids in two hours (fig. 1). Most of the weight loss occurred in the first 15 minutes following shucking. Oysters which had been removed from their shells with no damage to the underlying tissues by gently scraping the muscle attachment from each shell lost 25 percent less weight than did the oysters which had been punctured when shucked (fig. 2). The fluids were lost from the oysters shucked with a

and pericardium were intentionally ruptured during the shucking process.

minimum of injury by bleeding through the ends of the muscle and from fluid spaces in the body proper.

EFFECT OF STRESS FACTORS ON FLUID LOSS OF SHELL OYSTERS

A hypothesis has been set forth that oysters, by virtue of the ability to close their shells freely, are able to "escape" from their environment whenever an unfavorable environmental factor is present. Consequently, oysters have presumably not evolved complicated defense mechanisms because of their ability to shut off the environment under conditions of stress. The fluid content of oysters seems to be extremely labile and subject to rapid changes of quantity in times of stress.

Experiments were, therefore, designed to test this hypothesis and determine some of the conditions under which fluids and consequently weight are lost by oysters. In view of the hypothesis presented above, the most obvious experiment was to prevent the oyster from freely opening and closing its shells and determine the effects of this treatment upon the weight and fluid content of the oyster. Wedges

^{*} Dept. of Zoology, Newcomb College, Tulane University, New Orleans 18, La.

^{1/}This study was conducted by Tulane University under contract with the U. S. Fish and Wildlife Service. It was financed with funds made available under provisions of P.L. 466, 83d Congress, approved July 1, 1954 (commonly called the Saltonstall-Kennedy Act).

were, therefore, placed between the shells to prevent their complete closure. The oysters were weighed at intervals up to 150 minutes and the percentage change of the body weight was determined. Oysters which had been wedged open lost approximately 30 percent of their body weight by secreting fluids from the body into the space between the shells. This loss of weight occurred in wedged oysters kept in sea water and in air. Obviously oysters must be free to open and close their shells if they are to maintain a constant body weight and fluid content.

The next series of experiments was designed to determine some of the conditions under which the loss of fluid in oysters which had been wedged open could be altered. Oysters which had been wedged open were placed in normal, diluted, and concentrated sea water and weighed at several time intervals. The amount of fluid lost varied with the environment. Wedged oysters lost the most weight in concentrated sea water, and the least in diluted sea water. These data could be explained as a simple osmotic phenomenon.

EFFECT OF SALINITY ON COMPOSITION OF SEVERAL BODY FLUIDS

Additional experiments were, therefore, designed to determine how the salinity of the environment influenced the weight and salt content of unwedged oysters. Oys-

ters were, therefore, placed in sea water of several different salinities. At selected intervals the salinities of the several body fluids and the weights of the oysters were determined. The normal oysters in the water of different salinities neither gained nor lost weight yet the salinity of some of the body fluids changed. Obviously free movement of the shells allows the oyster to control its weight. Since no weight changes occurred, the oysters were not gaining or losing water in the different salinities, they must have changed the salinity of some of their body fluids by gaining or losing salt rather than water.

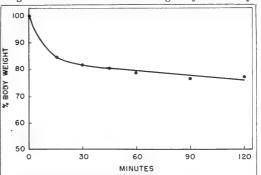


Fig. 2 - The weight changes of the body of oysters shucked without injury to the mantle or underlying parts.

By carefully opening oysters the fluids from several portions of the body could be collected individually. As a result of determination of the salinity of these fluid fractions taken from oysters in several environmental salinities, the observation was made that the deeper in the oyster one obtained the fluid, the less tendency was there for the salinity of the fluid to follow changes in the salinity of the environment, \underline{i} . \underline{e} . the blood in the heart showed the least change of all the fluids investigated.

The results were compared with data published for the Japanese oyster. The salinity of the blood of the latter oyster readily follows changes of the salinity of its environment which is not true of the Southern oyster. Evidently the Southern oyster is better adapted to life in an environment with changing salinity than is the Japanese oyster.

The oysters used in the experiments described herein were first and second year oysters. From the weight of the shell alone, one can determine with reasonable accuracy the age class to which the oyster belongs.

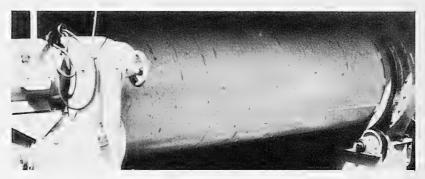
The data will be published in detail in a forthcoming issue of $\underline{\text{Tulane}}\ \underline{\text{Studies}}\ \underline{\text{in}}$ $\underline{\text{Zoology}}.$





MANUFACTURE OF EXPERIMENTAL MENHADEN FISH MEAL ON A PILOT-PLANT SCALE

One of the major problems confronting the menhaden industry is the control of processing variables so that satisfactory meals can be made consistently by the best available production equipment at reasonable costs. When one considers the capital expenditure for plant, equipment, etc., which is in use only 6 months at the average factory and indeed only 2 months for some, it becomes an even more important item than in a factory which operates on a year-round basis.



Cylinder of pilot-plant dryer,

During the summer and fall of 1955, staff members of the Fishery Technological Laboratory, College Park, Md., produced menhaden meals with pilot-scale equipment at one of the menhaden fishery centers. The pilot plant was supplied by a manufacturer of large-scale equipment to a commercial plant which serviced and maintained it for the use of Service personnel.

In the production of menhaden meal with the equipment generally used today there are theoretically about 15 variables which can be adjusted to alter the final products. In the case of the pilot plant it was not feasible to study all of these variables. The pilot plant consisted of four basic pieces: the cooker, the press, the beater, and the dryer. There was also a centrifuge available to separate oil from the press liquor. The fish were fed directly from a hopper to a 6-inch screw auger which carried the fish in a tight cylinder about 6 feet long while cooking. The fish were cooked by live steam introduced into the cooker through several manifolds. The amount of steam and the duration of cook could be controlled within limits.

The press, to which the cooked fish were next brought, was a continuous Rennenberg press about 4 feet long and $2\frac{1}{2}$ feet in diameter. It was essentially a constant diameter cylinder containing a tapering screw auger with the small end at the inlet to the press. The press liquor was extracted through screens which formed the walls of the cylinder. This press had a variable-speed driving motor. Attached to the motor was an industrial analyzer which permitted, in part, the determination of the power required to operate the press under different conditions.

The resultant press cake was broken up by means of a beater consisting of a power-driven shaft with numerous rodlike side arms rotating at high speed. The action of this beater broke the large pieces of press cake into smaller lumps so that there was a larger surface area per unit weight exposed to the drying action in the dryer.

From the beater the press cake was conveyed by means of a drag-chain elevator to the dryer. The dryer was heated by a gas-fired furnace which supplied a forced draft of hot air to the large drying cylinder about 5 feet in diameter and 15 feet long. The speed of rotation of the drying cylinder could be controlled to determine the time of travel of the scrap. The heat of the air in the dryer could also be regulated, but not the air speed.

After passing through the dryer the scrap fell through a trap door for collection. The air went through a cyclone separator to trap small particles of scrap. The cyclone separator acted as a collection unit when another type of drying cylinder, known as the "Dehydromat," was used during the last week of the experimental period. However, it is necessary to grind the press cake to much smaller particle size to use this dryer successfully. The pilot plant, as presently designed, did not include such a grinder and the trial with the "Dehydromat" dryer was not successful.

During the past summer and fall the staff found that the present design does not permit a satisfactory degree of control for all processing variables. For example, the cooker originally supplied had to be modified several times because the capacity was such that even when operating at the slowest speed with the least amount of steam introduced to cook the fish there were too many fish for the press to handle. This obviously prevented operation of the press at any but the highest speed. Other difficulties, such as wrong pressure valves on the gas supply to the dryer and absence of a press-cake grinder, also plagued the operators.

Nevertheless it was possible to study the effects of such variables as size and quality of raw fish, degree of cook, and temperature of drying on resultant meals. The effect of these variables on the nutritive quality of the meals produced will be determined by chick and broiler growing tests this coming winter.

--BY MAURICE BENDER, BIOCHEMIST, FISHERY TECHNOLOGICAL LABORATORY, BRANCH OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, COLLEGE PARK, MARYLAND.



CANNED SARDINE SPECIFICATION REVISED

A proposed revision of Federal Specification PP-S-51 (Sardines, Canned) has been prepared by the U.S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces. The specification incorporates requirements for Federal purchases of Pacific and of Maine sardines. It has been submitted to members of the sardine industries for comment. This draft, dated November 21, 1955, has not been approved and is subject to modification.



COLLABORATIVE PROGRAM BETWEEN SEATTLE FISHERY TECHNOLOGICAL LABORATORY AND UNIVERSITY OF CALIFORNIA

A collaborative study has been started under the Saltonstall-Kennedy research program wherein employees of the U. S. Fish and Wildlife Service's Seattle Technological Laboratory work in the Food Technology and Poultry Husbandry Department Laboratories of the University of California at Davis. Two programs are currently under way: (1) concerning the nutritive value of fish meal, and (2) the oxidative deterioration taking place in the meat of fish, fish meal, and fish oils which results in rancidity and discoloration. The latter program is under way at the Food Technology Department of the University of California where much important research of a similar nature has been carried out in the past on meats and other foods. The experience and findings from research on these other foods is now being adapted to problems of the fisheries in the current collaborative program.

During November a three-day meeting was held at the Seattle Fishery Technological Laboratory to acquaint the new collaborative employees and University of California staff supervisors with special problems of the fisheries. Discussions and demonstrations were directed toward pointing out problems in the fisheries which differed from those dealing with other foods. At the same time the University of California personnel were able to suggest several important applications of techniques used in research on other food products which will benefit other correlated projects being carried out at the Seattle Laboratory.



FEEDING FRESH-WATER FISH TO FUR ANIMALS

Sheepshead, carp, goldfish, burbot, and gizzard shad are species of fish from the Lake Erie area that may be used for feeding fur animals. Of these, only sheepshead were found to have no thiaminase when the whole fish were assayed. The other species in the particular series of samples tested, contained this enzyme in considerable amounts. This does not prohibit their use for feed, but it means that the fish will have to be cooked, or fed in a special feeding schedule.

The protein content of the whole fish was found to vary from 14 to 17 percent in the samples analyzed. The fat content was lowest in burbot, namely, 5 percent; then sheepshead, 8 percent; goldfish, 11 percent; carp, 12 percent, and highest in the gizzard shad, 18 percent. The fish can be classed as medium fat except for the gizzard shad.

Samples of fresh-water fish will be analyzed from time to time so data will be available on the effect of factors, such as geographical location and season, on nutrient content.



POSSIBLE USE OF ALASKA FISHERY WASTES AS POULTRY FEED

In Alaska, as in other fishing areas, the disposal of fish and shellfish wastes is always a problem. One of the possible methods for partially or wholly utilizing the waste material is to process the waste into meal for use in poultry feeding. Little information is available, however, concerning the feeding value of certain meals which could be produced from material available in Alaska. To obtain such

information, the Fishery Products Laboratory at Ketchikan has prepared experimental meals from pink salmon eggs, pink shrimp waste, and dungeness crab waste. These experimental meals are now being evaluated at the University of California and the University of Wisconsin for protein quality and unknown growth factors when used as poultry feeds. These universities are two of the contractors participating in the U. S. Fish and Wildlife Service research program now under way with funds made available under Public Law 466, commonly referred to as the Saltonstall-Kennedy Act.



PROGRESS ON OYSTER RESEARCH

The fourth bi-monthly report has been received from the group at Louisiana State University describing the research in progress with Louisiana oysters. The frozen oysters have been stored for six months, with no marked changes observed to date. Data on composition of oysters collected by the State from specific areas representing typical seed and growing areas have accumulated to the stage where certain seasonal trends are becoming evident. The group has also developed and evaluated two quick colorimetric tests for approximating the total bacterial count of fresh oysters. These tests may be of value in plant sanitation control or to indicate the probable storage life and general quality of oysters.



YELLOW DISCOLORATION IN FROZEN LOBSTER MEAT

Experiments carried out in Halifax, Canada, show that the yellow discoloration and the accompanying off-flavor that develop in stored frozen lobster meat appear to be associated with the oxidation of the red pigment to a yellow one. The oxidation occurs especially in the tips of the claws, which have a higher fat content than the rest of the meat. Development of discoloration is rapid in the window and open-seam push-cover types of can, neither of which should be used. The use of sealed cans, or vacuum pack cans, coupled with quick freezing and storage at low temperatures, should prevent any discoloration. Antioxidants, such as ascorbic acid, may also be effective.

--Atlantic Fisheries Experimental Station Circular No. 2, 1953, Fisheries Research Board of Canada,



Additions to U.S. Fleet of Fishing Vessels

Fishery-craft first documents were issued to 41 vessels of 5 net tons and over during October 1955, according to the U. S. Bureau of Customs. This was an in-

U. S. Vessels Issued First Documents as Fishing Craft, October 1955 and Comparisons									
Area	Octo	ber	Jan.	Total					
Area	1955	1954	1955	1954	1954				
	(Number)								
New England	1	-	17	22	23				
Middle Atlantic	1	-	12	14	15				
Chesapeake	10	8	44	84	93				
South Atlantic	11	13	61	110	119				
Gulf	15	10	92	293	313				
Pacific	3	4	110	104	117				
Great Lakes	-	2	7	5	6				
Alaska	-	1	31	24	27				
Hawaii	_	-	3	1	1				
Puerto Rico	-	-	-	-	2				
Unknown	-	-	-	1	1				
Total	41	38	377	658	717				
Note: Vessels have been assigned to the various areas on the basis of									

registered home ports.

crease of 3 vessels, compared with the number of fishing craft documented for the first time during the corresponding month of 1954.

In October 1955, the Gulf area led all others with 15 newly-documented craft, followed by the South Atlantic area with 11, the Chesapeake area with 10, the Pacific area with 3, and the New England and Middle Atlantic areas with 1 each. The Great Lakes, Alaskan, Hawaiian, and Puerto Rican areas had none.

During January-October 1955, a total of 377 vessels were documented for the first

time as fishing craft, compared with 658 for the corresponding period a year earlier--a decrease of 43 percent.



Alaska

SECRETARY McKAY RECOMMENDS AMENDMENTS TO LEGISLATION FOR GRADUAL ELIMINATION OF FISH TRAPS: Secretary of the Interior Douglas McKay on January 3, 1956, recommended three amendments to proposed legislation for the gradual elimination of salmon traps in Alaskan waters which was given the Department's general endorsement late last year.

In a letter to the House Committee on Merchant Marine and Fisheries, Secretary McKay said that the people of Alaska had supported a ten-year period for elimination of the traps. In view of this, Secretary McKay said, he felt that this period should be set in the legislation rather than the five-year period proposed in H. R. 242.

The Secretary recommended that appropriate amendments be made so that fractions do not count in applying the percentage formula to determine the number of traps to be closed each year.

He also suggested that all existing traps count as a base whether they are in actual operation or have been voluntarily closed at the Department's request. The formula in the proposed legislation, he said, would work a hardship on those who have cooperated in the Department's conservation program by voluntarily closing their traps.



American Samoa

TUNA CANNERY EXTENDS CONTRACT WITH JAPANESE FISHING VESSELS: The Saipan Maru, owned by a Japanese fishing company, has been operating as a floating cold-storage plant at American Samoa under a 6-months' contract with the United States firm operating the cannery on that Island. Recently the contract was renewed until November 1956, according to a translation made from Nippon Suisan Shimbum, a Japanese trade publication. The Saipan Maru (3,737 tons) was scheduled, however, to return to Japan temporarily, sailing from American Samoa about December 23, 1955. During its absence from Samoa its functions will be performed by the Chikuzen Maru (700 tons).

The number of fishing vessels to operate out of Samoa during 1956 will be 18, and the amount of fish to be taken by the United States firm will be 7,570 tons. Prices per ton to be paid the Japanese company by the United States firm will be: \$275 for albacore; for gilled yellowfin under 90 pounds \$180, from 90 to 130 pounds \$140, over 130 pounds \$100; for spearfish and miscellaneous species \$100.



California

PACIFIC HERRING FISHERY: Man has been playing a part in California's Pacific herring (Clupea pallasii) drama for more than 80 years. As early as 1875 there was a well established gill-net fishery in San Francisco Bay. Continuous statistics on the State's fish landings have been available since 1916 and in that 40-year period there has been a small, moderately steady herring fishery averaging less than a million pounds per year. Gill nets, beach seines, and lamparas have made these catches. The fish are sold fresh, salted, pickled, frozen, etc., and have been used for human consumption, chicken feed, and bait, according to the December 1955, Outdoor California, published by California's Department of Fish and Game.

Over the years Tomales and San Francisco Bays have been the most consistent producers of herring but good catches are often made in Monterey Bay. In the Monterey area the fish are taken in the summer--not during the winter and spring spawning runs.

Superimposed on the small fishery described above have been three short-time booms which resulted in landings of eight million to over nine million pounds in each of the three peak years.

The first during World War I lasted four years. The bulk of the catches was canned or reduced to fish meal but the canned product was not appetizing and did not sell well. Reduction of whole fish was stopped by a law enacted in 1921 which made it necessary to obtain a reduction permit from the Fish and Game Commission. No permits to reduce California herring have been issued.

A second peak occurred in 1948. Again the fish were used for canning, but most of the product tended to break up in the can and the flavor was not such as to encourage repeat orders.

The third boom lasted three years, 1951-53. Part of the herring were canned for export and part went into canned pet food. Neither type of product sold well.

By way of contrast with the bulk of the canned herring, one very tasty product was developed, but it proved so expensive to prepare that the canner abandoned the process.

Since 1953 there has been pressure on the Commission to issue permits for the reduction of herring into fish meal, especially in the Tomales Bay area. Because of the failure of the sardine fishery, numerous sportsmen and some commercial fishermen are afraid that if the herring were thrown open to reduction this fishery would share the sardines' fate. They insist that the herring must be retained to serve as forage fish for salmon and other predactious species.

Based on studies made by California's marine biologists it was recommended that no reduction permits be issued unless the Legislature first gives the commission the power to limit the catch of herring by all methods.

* * * * *

EFFECT OF TRINITY DAM ON SALMON AND STEELHEAD RUNS TO BE STUDIED: Detailed salmon and steelhead studies, to be conducted both by California's Department of Fish and Game and the U. S. Fish and Wildlife Service, will begin in 1956 to determine effects of Trinity Dam on their runs.

Groundbreaking ceremonies on the big dam, being built by the Bureau of Reclamation, were held in October 1955, but it will be several years before the stream used by the fish is blocked.

Many miles of spawning area above the site near Minerville, Trinity County, will be cut off by the dam.

Already written into the authorization legislation is a provision that no less than 150 cubic feet of water per second must be released into the river below the dam for fish life.

Operational studies at varying flows will be conducted by the California's Department and the Service to determine the best flows at various times of the year.

In addition to working closely with the Federal Government on the Trinity Project, the Department of Fish and Game is making recommendations concerning the proposed San Francisco Bay Barrier, Feather River Project, Coyote Dam on the Russian River, and many other lesser projects.

Public Law 732 (79th Congress) provides that on all water or power projects developed by Federal agencies, or over which there is Federal jurisdiction, state fish and game agencies must be consulted.

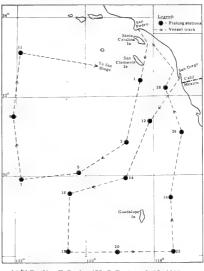
This includes privately-built power projects, which are licensed by the Federal Power Commission, according to <u>Outdoor California</u> (November 1955), a California Department of Fish and Game publication,

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ALBACORE TUNA SEASONAL DISTRIBUTION EXPLORED IN EASTERN NORTH PACIFIC (Cruise 55-C-7): In order to aid in exploring the distribution of albacore tuna in the eastern north Pacific Ocean during the season for this fishery and making biological and limited oceanographic observations which may possibly relate to

the occurrence of this species, the Scripps Institution of Oceanography provided the M/V Paolina T, oceanographic equipment, and shoreside analysis of oceanographic data collected, the California Department of Fish and Game provided fishing gear and two biologists, and the South Pacific Fishery Investigations of the U.S. Fish and Wildlife Service provided plankton equipment and shoreside analysis of samples. The cruise (August 3-August 26, 1955) of the Paolina T occurred simultaneously with NORPAC's oceanographic survey of the entire north Pacific Ocean and with the U.S. Fish and Wildlife Service Pacific Oceanic Fishery Investigations vessel John R. Manning's explorations for albacore tuna in an area to the north, northwest, and west of the Paolina T.

The following is a typical day's operation when running station lines. Forty baskets of long-line gear were set from 0600 to 0730 hours. While the gear soaked, 4 artificial lures were trolled 4 to 5 hours in the immediate vicinity of the long-line set and a standard 200-meter oblique plankton tow was made near the center buoy at 1100 hours. Retrieving of the long-



M/V Paolina T Cruise (55-C-7), Aug. 3-26, 1955.

line started at 1230 hours and on completion, usually 3 hours, the course was set for the next fishing station, approximately 96 miles away. En route to the next station, during daylight hours, 4 lines were trolled and a watch kept for signs of surface schools of fish and bird flocks. At night, usually commencing at 2100 hours, a plankton tow was made followed by one hour of fishing with a fine-meshed dip net under a 750-watt light.

Bathythermograph casts, to 900 feet, were made at each end of a long-line set, while occupying a night-light station and at such intervals while under way as time permitted. The thermograph was operated continuously throughout the cruise.

At each fishing station three depths were fished. The surface was sampled by trolling artificial lures of various types. Two subsurface depths were fished by rigging 20 baskets of long line with five-fathom float lines and 20 baskets with 15-fathom float lines. Fresh-frozen sardines, 3 and 4 to the pound, were used as bait. Chemical sounding tubes were used to determine the fishing depth of each section of long line. In general, the gear was set slack with the vessel traveling at its slowest speed. In several instances, however, the gear was set taut in an attempt to place the hooks through the known shallow thermocline.

The plankton tows consisted of the standard oblique tow, a net with a one-meter opening and No. 30 bolting silk bag. In order to sample from a depth of 140 meters to the surface, 200 meters of cable was paid out.

The long lines, fishing below the surface, caught albacore at every station within the survey area except at stations 18 and 20 (see chart), located at lat. $28^{\circ}04^{\circ}$ N..

long. $120^\circ 40^\circ$ W. and lat. $28^\circ 09^\circ$ N., long. $117^\circ 22^\circ$ W., respectively. The overall catch rate was 2.8 albacore per 100 hooks. These subsurface fish appeared to be concentrated, 9.5 albacore per 100 hooks, in a narrow band of water bounded by latitudes 31° and 32° N. and extending westward from the coast to 122° W. longitude (the western limits of the survey). To the north and south of this area the catch rate dropped to 3.22 fish per 100 hooks and less. There was no apparent pattern to the longitudinal or east-west distribution of subsurface albacore.

The surface distribution of albacore, as revealed by trolling and the occurrence of visual schools, presents a different picture from that of the subsurface distribution. Only one small area, near station 26 at lat $31^{\circ}00^{\circ}$ N., long. $117^{\circ}07^{\circ}$ W., did a concentration of fish manifest itself. Over half of all the troll-caught albacore were taken here. Six of the seven schools of albacore sighted were also seen in this area. The seventh school was seen on the adjoining station (No. 28) to the north.

Statistical Data on Paolina T Cru	tise (55-C-7), August 3-26, 1955
Long-line fishing stations - 15 Total baskets fished - 593 Total hooks fished - 6,274 Average fishing depthmiddle hook 5-fathom floatline (17 observations) - 70.8 faths. 15-fathom floatline (14 observations) - 76.8 faths. Trolling time: On fishing stations - 55 hours 25 mins. Between stations - 60 " 30 " Total - 115 hours 55 mins. Fish catch: Trolling, on stations 8 albacore ", between stations 14"	Fish catch (Contd.): Long line: 177 albacore 1 broadbill 1 black striped marlin 1 opah 1 dolphin fish 141 blue sharks 4 bonito sharks 2 pelagic rays Surface schools of albacore sighted: - 7 General area: 29°33'N., 117°20'W. to 32°28'N., 117°49'W.

The only apparent relationship between the long-line catch and the troll catch occurred in the area encompassed by stations 24, 26, and 28 between latitudes 29°30′ N. to 32°30′ N. along longitude 117° W. Within this group of three adjoining fishing stations the long-line catch dropped as the number of surface fish increased. However, it is well to note that this same relationship did not manifest itself on the four other occasions where surface fish were taken.

The length frequencies of the long line-caught albacore indicate that there were two principal groups with modes at 64 cm. (25 inches) and 81 cm. (31.9 inches). The bulk of the fish were grouped about the smallest mode which contained 16.6 percent of the total, while the largest mode had only 4.0 percent. The troll-caught fish were 40 percent one-size group with a mode at 64 cm. (25 inches). It appears from the above, plus other data from the long-line catches, that the larger fish were well below the surface while the smaller fish were dispersed vertically.

A fair portion of the long line-caught albacore were sufficiently strong on capture to warrant tagging. This suggests that the fish were caught as the line was being retrieved, either at the surface or at some other depth. The small percentage of troll-caught fish (surface) and the general absence of visual schools is a strong indication, however, that the long line-caught fish were taken at depths other than the surface layers.

All albacore in good condition were tagged with type G white spaghetti tags. Of the 93 released, 17 were caught by trolling and 76 by long lines. On 38 fish, the tag was attached in a new position, approximately $\frac{1}{2}$ inch below the insertion of the second dorsal fin. On the other 55 fish, the tag was positioned in the customary place, below the posterior end of the second dorsal fin or under the first finlet.

Unfavorable weather conditions and mechanical difficulties on August 12 caused a major change in the original cruise plan. This involved abandoning the area due west of the commercial fishing grounds, a section of water bounded by latitudes 30° N, and 34° N, and longitudes 124° W, and 134° W, and exploring instead the southern portion of the fishing grounds, latitudes 30° N, south to lat. 28° N, and between long, 121° W, and 116° W.

On August 14, a few miles off Point Loma, San Diego, the only other surface schools of fish were seen. By their size and behavior these fish were tentatively identified as anchovies or small sardines. Several large groups of porpoise, 35 to 50 individuals per group, were actively preying on them. It was also in this area that the only large concentrations of birds (shearwaters) were seen; they were not feeding on the surfacing schools of fish.

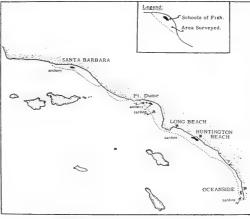
Sauries (Cololabis saira) were found at each night-light station; however, in general these fish were not very numerous. The sizes ranged from 12 mm. (0.47 in.) to 259 mm. (10.2 in.), with the principal mode at 33 mm. (1.3 inches). Fish 100 mm. (3.9 in.) and over were relatively scarce; they were collected at only two stations, observed on three or four others and never more than 3 or 4 individuals at a time. Several species of lanternfish were also taken quite frequently. Tunicates, primarily Pyrosoma sp., were fairly numerous throughout the area, not only under the light but also in the plankton tows.

* * * * *

AIRPLANE AND VESSEL STUDY SAMPLING AND MEASUREMENT OF FISH SCHOOLS (Airplane-Spotting Flight 55-13): In order to explore the possibilities

and limitations of airplane-boat sampling and measurement of schools of fish, the California Department of Fish and Game conducted a series of tests with an airplane and the research vessel Yellowfin working together. It was found that the airplane and a small skiff working together and using two-way radio equipment could determine the length, width, depth, and species composition of the schools. Flights of the Department's Beechcraft 4758 N. took place four hours daily from November 15-16,1955, over the inshore area from Santa Barbara to Oceanside.

<u>Fish Behavior and Distribution:</u> As during the same month in 1954, most of the adult sardine schools were "night" fish and



Beechcraft Flight 55-13, Nov. 15-16, 1955.

did not appear in large numbers during the daylight hours. Three small groups of sardines were sighted off Santa Monica, Huntington Beach, and Oceanside. The schools observed were small (less than 50 tons each) and were very wild. The large sardine schools off of Pt. Dume and Oceanside upon which the commercial fleet was operating at night were not visible. The migration distribution of the sardines was comparable to the November distribution of the previous season.

Research: The small school group of sardines off Huntington Beach presented an excellent opportunity for experimentation as these schools were very wild and represented the most difficult type of schools to measure and sample. A portable Bendix depth recorder was installed in the skiff so that the depth of the schools could be determined. Jig lines made up of bare silver single and treble hooks attached to monofilament line were used to obtain samples.

Attempts to cross over schools were not successful with the Yellowfin as the fish would shy away from the boat. The skiff was maneuverable and the aerial observer was able to direct the skiff over any of the schools. A sample of adult sardines was collected with jig lines while the skiff drifted over a school of fish. Estimation of the surface area of the schools could be determined by the aerial observer as the skiff passed over the school.

"YELLOWFIN" COMPLETES FINAL 1955 CRUISE TO ASSESS ABUNDANCE OF SARDINES, MACKEREL, AND ANCHOVY (Cruise 55-Y-9): The final 1955 cruise (November 3-22) covered the most northerly sector of the coast between Bodega Bay and San Diego. In addition to studies of the relative abundance of sar-

Legend - Sardines - Pacific mackerel - Anchovy Jack mackerel - Route of cruise (Each mark represents Buch

dines, Pacific mackerel, jack mackerel, and anchovies, the California Department of Fish and Game's vessel Yellowfin resurveyed the area south of Point Conception and attempted to sample schools of fish close to where the commercial fleet was operating. During daylight hours (November 15-16) the Yellowfin worked in conjunction with a State-owned airplane in survey and sampling work.

Over the entire area worked, 69 light stations were occupied and sets with the blanket net yielded one sample of adult sardines, 8 of northern anchovies, 3 Pacific mackerel, and 3 jack mackerel. The single sardine sample obtained consisted of large fish (9.5-11 in. total length) taken very close to shore at Port San Luis (Avila). No concentrations of fish schools were seen around this area north of Pt. Conception and it seems likely that these sardines represented only "stragglers" which moved inshore from the spawning grounds earlier in the season. Anchovies were observed and sampled from Monterey Bay south to the San Diego area. Jack mackerel, though San Diego taken in a sample as far north as Avila, were much more abundant south of Point Conception. Pacific mackerel appeared to be concentrated M/V Yellowfin (Cruise 55-Y-9), Nov.3-22,1955. mainly south of the Los Angeles area.

The Yellowfin traveled a total of 500 miles scouting for fish schools. A total of 135 schools were observed of which it was estimated that 37 were composed of sardines, 38 northern anchovies, 2 jack mackerel, 3 Pacific mackerel, 33 sauries, and 22 which were unidentified. The sampling activities south of Pt. Conception

were greatly hampered by adverse weather conditions. This was particularly true in the areas where the concentrations of sardines were judged to be the highest (Port Huenee-Pt. Dume and Newport Beach to Oceanside). Surface temperatures, bathythermograph casts, and reversing-thermometer casts were taken at all possible stations. Surface temperatures ranged from a minimum of 10.4 °C. (50.7°F.) at Half Moon Bay, to a maximum of 16.3°C. (61.3°F.) at Santa Barbara.

Experimental daytime work was conducted in the Newport Beach area using the State airplane, the <u>Yellowfin</u>, and a whale boat. This area contained numerous small schools of sardines and by means of radio communication the plane was able to direct the vessels over the schools. Preliminary attempts at sampling these fish proved successful, and although much experimental work must be done, we are hopeful that future survey work can be considerably expedited by an increased use of aerial observation.

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MARKET CRAB ABUNDANCE UNDER STUDY: "Robert Croll" and "Donna" (Cruise 55-C-8): The services of the two commercial fishing vessels Robert Croll and Donna were made available to California's Department of Fish and Game (1) to determine the abundance and condition of the market crab (Cancer magister), (2) to

conduct escape-opening tests, (3) to tag 300 legalsize male crabs, and (4) to sample female crabs for fertility studies. The cruise (October 22-November 2, 1955) was conducted along the central California coast between the mouth of the Russian River and Point Reyes in depths of 5-36 fathoms.

A total of 60 traps were used to make 160 sets in crab fishing areas off Duncan's Landing, Bodega Head, and Pt. Reyes. A total of 138 of the 159 sets (one trap lost) were sampled at random.

A total of 2, 367 market crabs were caught in the 138 sampled traps. Of these 1, 580 (67 percent) were legal 7-inch males and 786 (33 percent were) sublegal size. Only 6 females were caught. The percentage of legals per trap ranged from 52 percent at Outer Bodega Bay to 90 percent off Pt. Reyes. Three percent of the legal-size crabs and 20 percent of the sublegals were soft. Seven-inch crabs in the Outer Bodega Bay area ranged from 2-11 percent soft. In area "H" off Pt. Reyes only one percent of the legals were soft.

Circular escape openings of $4\frac{1}{4}$ " inside diameter were on 64 traps. An average of 10.2 legals per trap were caught with $4\frac{1}{4}$ " escape openings as compared to an average of 9.8 legals per trap without escape openings. There was an average of 4.2 sublegals per trap with escape openings as compared to

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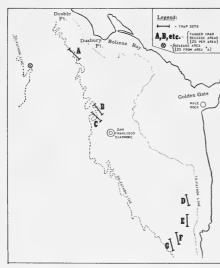
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M/V Robert Croll and Donna market crab Cruise (55-C-8), Oct.22-Nov.2, 1955.

legals per trap with escape openings as compared to 8.0 sublegals per trap with no provision for escapement.

A total of 300 legal-size crabs were tagged--50 were tagged off the Russian River area, 125 in Outer Bodega Bay and off Bodega Head, and 125 in the Pt. Reyes area. Plastic Petersen disk tags were used. Tags were placed on the carapace near the outermost spine. A nickel pin was run through the carapace, holding one disk on top and another on the underside of the carapace.

"Josephine" and "J. F. Pomilia" (Cruise 55-C-9): Two other commercial fishing vessels donated their services to California's Department of Fish and Game to determine (1) the abundance and condition of the market crab (Cancer magister),



M/V Josephine and J. F. Pomilia market crab Cruise (55-C-9), November 3-9, 1955.

(2) to tag 300 legal-sized male crabs, and (3) to sample female crabs for fertility. The area covered by the cruise of these vessels was extended along the coast of California from Double Point in the north to Point San Pedro in the south.

During the cruise (November 3-9, 1955), a total of 71 crab traps were used to make 142 sets; 73 sets were sampled at random. Sets were made off Double Point, San Francisco Lightship, and Pt. San Pedro in depths of 13 to 30 fathoms.

A total of 2,595 market crabs were caught in the 73 sampled traps. Of these, 2,077 (76 percent) were legal 7-inch males and 509 (24 percent) were sublegal. Only 9 females were caught. The percentage of legal-size crabs per trapranged from 67 percent in the San Francisco Lightship area to 90 percent off Pt. San Pedro. Six percent of the legal-size crabs and 42 percent of the sublegals were soft. Seven-inch crabs ranged from 10 percent soft in the Double Point area to 2 percent in the Pt. San Pedro area.

A total of 250 legal-size male crabs were tagged with Petersen disks attached by nickle pins run through the carapaces--50 were tagged off Double Point; 50 in the vicinity of the San Francisco Lightship; and 150 in the Pt. San Pedro area. Rough weather precluded further tagging operations after November 9, 1955.

Spermathecae were removed from all females captured on all crab cruises for future fertility studies at the Stanford laboratory. It was noted that several of the females had recently entered the egg-bearing stage.



Cans--Shipments for Fishery Products, January-November 1955



Total shipments of metal cans for fish and sea food during January-November 1955 amounted to 97,599 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 102,533 short tons for the same period last year.

The packs of canned tuna, Maine sardines, and salmon in 1955 were all lower than in 1954.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Federal Aid Programs Help Restoration

On a thousand fronts, in every section of the country, fish and game specialists are fighting the fight to keep America's fish and wildlife resources apace with or ahead of the ever-increasing demand.

The huge conservation program which is being carried on aggressively by each of the 48 states and the Territories is bolstered by a Federal aid program which during the last fiscal year made nearly \$16 million available to the states, Acting Secretary of the Interior Clarence A. Davis announced December 16.

The money is used on state projects which have promise of fish and game restoration and are approved by the Fish and Wildlife Service. These projects may be of a physical nature--acquisition of land and waters, development of fishing lakes, feeding and breeding areas or sanctuaries; or they may be research efforts designed to increase the fish and game supply by solving the many problems for which the specialists have no answer.

The objective of the Federal aid program—the restoration of fish and wildlife—is further buttressed by vigorous, effective, and varied projects conducted with state funds, and by the farflung refuge, research, and hatchery program of the Fish and Wildlife Service.

"The need for this continuous, all-out effort at restoration of our fish and wildlife resources is substantiated by cold statistics," Davis said. "In 1954 there were 18.5 million persons in this country holding state fishing licenses. This is twice the number held ten years ago and it is increasing at the rate of a million a year.

"Add to this the fact that our increasing population and our increasing needfor homes and for farm and industrial lands and for more water means that fish and game habitats are shrinking faster than new ones can be developed. Then an idea of just what kind of task lies ahead for those who would perpetuate our wildlife resources is apparent."

Some of the accomplishments in fish restoration were:

Forty-three states engaged in one or more vitally important fact-finding projects.

Thirteen states eliminated undesirable fish from a total of 36 lakes.

Six states had projects for stream development and watershed improvement.

Sixteen states purchased land for public fishing areas. Nearly 2,700 acres were purchased and an additional 56,000 acres were leased for fishery projects.

Seventeen states and Alaska constructed access roads to fishing areas.

Considerable knowledge was gained by research on poisoning of a lake or stream to rid waters of trash fish without unduly harming sport fish.

Studies were in progress on ways and means of making reservoirs more productive and better able to fill the need for more public fishing waters.

Marine fish and fishing came under the scrutiny of biologists in 12 of the coastal states. Studies varied from survival of ocean salmon in California to Atlantic salmon migration in Maine.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASES BY THE DEPART-MENT OF DEFENSE, OCTOBER 1955: For the use of the U. S. Army, Navy, Marine Corps, and Air Force, the Army Quartermaster Corps during October 1955 purchased 2.0 million pounds (valued at \$0.9 million) of fresh and frozen fishery

Purchases of Fresh and Frozen Fishery Products by Department of Defense (October and the First Ten Months of 1955 and 1954)								
	QUANTITY VALUE							
Oct	October Jan, -Oct,		Oct	ober	JanOct.			
1955	1955 1954 1955 1954 1955 1954 1955 1954							
. (Millions of Pounds) .			. (Mi	llions	of Dolla	rs) .		
2.0	2.0	21.3	21.0	0.9	0.9	9.2	8.6	

products. This was an increase of 11.0 percent in quantity and 6.1 percent in value as compared to September purchases. October 1955 purchases were higher by 0.9 percent in quantity and 1.8 percent in value, than purchases for October 1954.

Purchases of fresh and frozen fish for the first ten months in 1955 totaled 21.3 million pounds (value \$9.2 million)--higher by 1.4 percent in quantity and 6.1 percent in value as compared with the first ten months of 1954.

Prices paid for these fishery products by the Department of Defense in October averaged 43.9 cents as compared with 45.9 cents in September 1955 and 43.5 cents in October 1954.

Great Lakes Fishery Investigations

"CISCO" RETURNS FROM SURVEY TRIP OF NORTHERN LAKE MICHIGAN (Cruise XI): Weather conditions during the cruise (November 1-12) of the Great Lakes Fishery Investigations research vessel Cisco were extremely unfavorable. Rough seas were prevalent during practically the entire cruise so that some of the scheduled operations could not be completed. The cruise was the fourth in a series covering the same general areas of northern Lake Michigan.

Experimental nylon gill nets were set at 25, 50, 80, and 135 fathoms off Frankfort, Mich., and at 25 and 50 fathoms off Sturgeon Bay, Wis. Bloaters (Leucichthys hoyi) predominated in the 25- and 50-fathom sets on both sides of the lake. The catches at both depths were heavier on the east side of the lake. Leucichthys kiyi was the most abundant species in the 80-fathom sets, and was practically the only species in a very large catch at 135 fathoms. Most of the L. kiyi taken in the deeper set were of a small-medium size and were caught in the smaller mesh sizes (2 and $2\frac{1}{4}$ inch, stretched measure). Many L. kiyi were spawning and ripe specimens were taken at all depths fished. Three of the scarce blackfin (L. nigripinnis) were caught in the sets off Frankfort and three alewives (Pomolobus pseudo-harengus) were taken off Sturgeon Bay.

Hydrographic transects were made across northern Lake Michigan from Frankfort to Sturgeon Bay and from Manitowoc, Wis., to Ludington, Mich. Three hydrographic stations were visited along each transect. Bathythermograph casts were made at 5-mile intervals and drift bottles were released at several points along the transects.

Thermal stratification is present in northern Lake Michigan only in the very deep water. Surface waters, which ranged in temperature from 4.6° C. (40.3° F.) to 10.7° C. (51.3° F.), were generally somewhat warmer on the east side of the lake than on the west side.

Night midwater trawling operations were carried out at 25 fathoms where the water was homothermous from top to bottom. Very little was caught. It appears that chubs do not become concentrated at midlevels except in connection with a sharp thermocline.



Maine

CANNED MAINE SARDINE, CONSUMER-ACCEPTANCE TESTS: A nationwide program of consumer-acceptance tests covering the various packs of Maine sardines will be launched early in 1956, according to news releases from the Maine Sardine Industry. The Executive Secretary of the group said on December 24, 1955, that more than 4, 200 families in 12 cities will be personally interviewed for what is considered to be an adequate cross-section of the country's population.

From the tests, the Maine Sardine Industry hopes to obtain valuable information on the consumer side of the sardine market which will assist the packers in planning for the future.

Families will be asked to state their preferences for the different packs after actually tasting and examining samples which will be opened for them by the interviewer.

Eight different processes will be tested, including conventional, baked, fried, mustard, tomato, raw pack, can-cooked, and Belgium cooker.



Maryland

1955/56 OYSTER SEASON GOOD: With the advent of cooler weather in the fall of 1955, sales of oysters were brisk and prices on the Chesapeake were high for the season. A short supply in the more northern states and heavy losses that occurred in some parts of Virginia in the summer of 1955 greatly augmented the demand for local oysters. Large fleets of tongers were busily engaged in harvesting the 1955/56 crop and were making exceptionally high earnings in some areas where supplies are abundant. Favorable weather was a substantial factor infavoring good catches, states the December 1955 Maryland Tidewater News.

As a rule early September 1955 catches contained relatively few "fat" oysters. Oysters consume much stored food during spawning in summer. The organisms upon which they feed are less abundant in warm water and oysters also suffer from the ills to which they are prey. The result then is that oysters typically are in their poorest condition at the end of the summer. With the coming of fall weather the surface waters, which produce the tiny microscopic plants upon which oysters feed, become heavier as they cool off. These heavier surface waters then sink and displace the warmer bottom water with its summer-long accumulation of rich fertilizing ingredients that have resulted from decomposition of aquatic organisms. The enriched water, now brought to the surface where sunlight can stimulate plant growth, quickly produces an abundance of the tiny plants needed to make oysters fat and tasty. The heavy rains from the summer hurricanes, destructive, though they were in some areas, contributed further to the waters' richness. The result was that oysters fattened rapidly and towards the latter part of 1955 were in top condition in most areas. It is significant that fattening takes place earlier on up-river and upbay bars where the water cools more rapidly and where the nutrients brought in by streamflow first reach oyster-producing waters.

* * * * *

UNDERWATER BREATHING APPARATUS USEFUL TO BIOLOGISTS: The biologists at the Chesapeake Biological Laboratory at Solomons have made good use of a relatively new tool in aquatic research in recent months—a self-contained underwater breathing apparatus or SCUBA. This equipment, such as the "Aqualung," the "Northill," and the "Scott Hydropak," opens up new vistas for research on aquatic life. For example, it is one thing to study the life history of oysters, clams, and other bottom forms from samples brought to the surface; it is quite another thing to be able to study these forms undisturbed in their natural environment. The diurnal migrations of aquatic forms, their spawning behavior, and the efficiency of various types of nets and collecting gear in sampling the species that are present, all can be studied to very great advantage by a biologist equipped with SCUBA.

SCUBA has been used to observe the operation of a small experimental trawl used in collecting specimens of aquatic organisms, according to the November 1955 Maryland Tidewater News of the Maryland Department of Research and Education. There had been some doubt as to how well this trawlhad been fishing, what the width of its path across the bottom was and how the floats kept the mouth of the net. A biologist wearing the Northill apparatus was towed behind the boat pulling the trawl in 15-20 feet of water during mid-September 1955. It was observed from close quarters that the trawl doors kept the net well extended and that the floats were sufficient to keep the headline up. The net ballooned out behind with the cod end floating off the bottom and the trawl doors slid along on their metal-clad lower edges. Athigher speeds there was a tendency for the whole net to lift off the bottom but notes were made on the highest possible speed consistent with the net skimming on the sand. Fish were scarce, but many blue crabs were observed to swim ahead as the net disturbed them until they were finally engulfed.

The apparatus is also being used in the collection of toadfish used in a cooperative study to shed new light on the causes of diabetes. In a rotenone project, SCUBA was used to ascertain what proportion of the suffocated fish sank to the bottom. Divers from the Department of Research and Education and the Chesapeake Bay Institute swam along survey lines laid across the bottom of a cove collecting all fish which had sunk along these predetermined paths. This contributed greatly to the accuracy of the estimate of the fish population. Research on the soft-shell clam (manninose), Mya arenaria, will be greatly facilitated by the use of this equipment allowing a biologist to observe the clam areas underwater. In clamming areas in other states the tides uncover clam flats and experimental work and observations can be carried out at that time. Since the clam flats are almost always covered in tidewater, SCUBA may be the answer to work with soft-shell clams in their natural environment in Maryland.

National Canned Salmon Week

A nationwide canned salmon publicity campaign-"National Canned Salmon Week"--will be featured again this year. The Pacific Coast Canned Salmon Brokers selected February 12-22, 1956, as the dates for this year's "Canned Salmon Week."

Trade publications, daily and weekly newspapers, radio, television, and other effective media will be used to publicize and popularize canned salmon. Some firms will join in with brand advertising.

Publicity will emphasize the economical nutritious food value of canned salmon as a concentrated, cooked, vitamin-rich protein food, "ready to eat right out of the can," or served in salads or hot dishes.

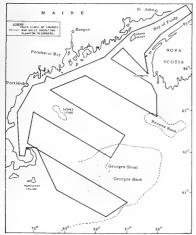
Special canned salmon menus for display on dining cars will be printed by the Great Northern Railway to observe the week, calling attention to salmon, the great natural resource of Alaska, Puget Sound, and Columbia River areas.

Union Pacific, Southern Pacific, Pennsylvania Railroad, the New York Central System, and the Wabash Railroad Company are still other rail-dining services which will feature canned salmon dishes during the special week and throughout Lent.

State restaurant associations will serve as important distribution mediums for material on canned salmon quantity recipes and "Silver from the Sea" menu clip-ons. Plans for such distribution were completed with restaurant associations of Tennessee, West Virginia, Iowa, Wisconsin, Arkansas, Kansas, Louisiana, Alabama, New York, and North Carolina.



North Atlantic Herring Research



Young herring sought on Cruise 8 of the Service's research vessel Theodore N. Gill.

"THEODORE N. GILL" SEARCHES FOR YOUNG HERRING (Cruise 8): In order to capture young herring or larvae and to obtain some measure of their abundance in the Gulf of Maine, a plankton survey of the Gulf of Maine, Georges Bank, and the Bay of Fundy was made in November and December 1955 by the Service's research vessel Theodore N. Gill (Cruise 8, November 7-17, 1955, and November 28-December 3, 1955).

This work is being done in an effort designed to learn (1) where herring larvae are produced, (2) the degree of success of this year's spawning, (3) the degree of survival, (4) factors influencing survival, and (5) the patterns of drift of the larvae.

Plankton was collected with a one-meter silk net and with "Hardy" continuous plankton recorders. Two of these recorders were operated while running full speed (approximately 9 knots) along a predetermined course. One machine was towed at the water's surface and one at the 10-meter depth. These recorders strain out a sample of plankton (including young

herring) as they are drawn through the water, collecting it on a moving strip of graduated silk gauze, and winding it onto a spool. These spools of gauze are returned to the laboratory for analysis.

The cruise was originally planned for the period of November 7 to 17, but due to time lost because of adverse weather, an additional trip from November 28 to December 3 was required in order to finish the outlined work.

Temperature records were made of the surface water with a recording thermograph and of the subsurface water with a bathythermograph.



North Atlantic Fisheries Exploration and Gear Research

<u>DEEP-WATER OCEAN PERCH FISHED BY "DELAWARE"</u> (Cruise 12B): A search for deep-water ocean perch was the principal mission of this cruise (Novem-



ber 30-December 15, 1955) of the Service's exploratory fishing vessel <u>Delaware</u>. Operating south of St. Pierre Bank, the largest catch of the cruise consisted of 2,000 pounds of medium-size ocean perch taken at 225 fathoms.

The vessel's explorations of fishery resources in deep water at the edge of the Continental Shelf were extended eastward by this cruise. However, storms permitted only eight one-hour drags with the otter-trawl gear. During one particularly violent storm, winds attained a velocity of 75 miles an hour, with gusts up to 100 miles an hour.

Area explored by the Service's exploratory vessel Delaware for deep-water ocean perch (Cruise 12B).

It was also planned that operations during this cruise would include deep-

water trawling at the western edge of Grand Bank, but weather did not permit the carrying out of this objective.



Pacific Oceanic Fishery Investigations

YELLOWFIN TUNA FISHING TRIP OFF LINE ISLANDS COMPLETED BY "JOHN R. MANNING" (Cruise 27): A five-week tuna fishing trip to the Line Islands, about 1,000 miles south of Hawaii, was completed by the Service's research vessel John R. Manning on October 29 when it returned to Honolulu. The cruise was part of a year-round program of observations designed to reveal the seasonal fluctuations in the abundance of yellowfin tuna in the most promising of the tuna fishing grounds discovered by Service scientists in the equatorial central Pacific.

The center of yellowfin abundance in the region appeared to have shifted slightly to the northward, and the best long-line catches were made in the vicinity of Palmyra Island instead of Christmas Island, where the best fishing has usually been found on previous cruises. Surface schools of smaller yellowfin (weighing 30 to 50 pounds each) accompanied by flocks of birds were very abundant around Washington Island, but the schools were wild and tended to disperse when the vessel approached, which made it difficult to fish them effectively by trolling.

A considerable number of small yellowfin were taken on the trolling lines, however, and most of them were successfully tagged and released alive. The tagging done on this cruise brings to a total of more than 900 the number of yellowfin tuna marked and released by POFI scientists in the Line Islands region. It is anticipated that recaptures of these tagged fish, either by Hawaii-based vessels in the central Pacific, by Japanese fishermen in the equatorial western Pacific, or by the California tuna fleet in the eastern Pacific, may reveal important information on the migrations and growth of this commercially-valuable species.

Frequent observations of surface and subsurface water temperatures were made during the cruise. A permanent temperature-recording device which had been installed off Christmas Island on another recent POFI cruise was serviced. The data

so obtained will be analyzed for evidence of shifts in currents and water masses that may be related to changes in the abundance of tuna on the equatorial fishing grounds.

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SEASONAL TUNA ABUNDANCE IN LINE ISLANDS STUDIED BY "JOHN R. MANNING" (Cruise 28): Long-lining and trolling for yellowfin tuna around the islands of Christmas, Fanning, Washington, and Palmyra in the Line Islands group (about 1,000 miles south of Hawaii) was the purpose of the one month's cruise by the Service's research vessel John R. Manning, which returned to Pearl Harbor on December 17. This experimental fishing was part of a year-round program to chart the seasonal and longer-term fluctuations in tuna abundance in an area pioneered as a tuna-fishing ground by U. S. Fish and Wildlife Service vessels. Although valuable data were collected and 40 yellowfin tuna were successfully tagged and released, the level of abundance encountered on this cruise was unusually low by comparison with past cruises. At the best long-line station, northwest of Christmas Island, the tuna catch rate was only 1.5 fish per 100 hooks, while the waters off Palmyra Island, where the best trolling was found, produced only slightly over 2 tuna per hour of fishing.

Five long-line stations were fished, 3 of 60 and 2 of 99, 11-hook baskets. The remaining scheduled stations could not be fished because of line-hauler breakdowns. Catches at the stations that were made, from south of Christmas Island to the vicinity of Fanning Island, indicated a low level of abundance of yellowfin tuna. The average catch rate was 0.53 fish per 100 hooks, with a maximum, northwest of Christmas Island, of 1.55.

Trolling with six lines in the immediate vicinity of the islands was only slightly more productive, with a total yellowfin catch of 64 for 108 hours of fishing. The best catches were made on the first 2 days off Palmyra, when the taking of 18 yellowfin each day gave a catch rate of slightly more than 2 fish per hour. Trolling produced the usual incidental catches of wahoo, the day's record being 53 taken at Washington Island.

Of the total of 80 unmutilated yellowfin taken by both methods, 40 were tagged and released alive for study of their growth and migrations. The remaining $40\,\mathrm{were}$ examined as to food habits and sexual maturity.

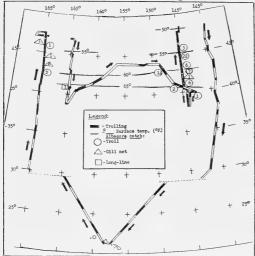
A section of bathythermograph casts at frequent intervals was made down $156\,^{\circ}30^{\circ}$ W. from 10° N. to the equator. A series of three 10-mile BT. sections was completed northwest, west, and southwest out of the London anchorage at Christmas Island with casts at 1-mile intervals.

Fishing was attempted on a commercial scale by setting 100 baskets of tuna long-line gear out of a revolving tub in which the main line is flaked down continuously instead of being disassembled into 11-hook units as it is hauled. Despite minor defects, the tub proved highly successful on the haul and lightened the fishermen's labor considerably. The 1,003-1,042 hooks fished on two stations compares well with the average of 1,500 fished by Japanese long-liners employing 3 times as many fishermen as the John R. Manning.

Five night-light stations were made at various anchorages and in the open sea; records were made of sightings of tuna schools and other biological phenomena; stomachs of the 4 skipjack captured were preserved; records of meteorological and hydrological observations by resident observers were picked up at Christmas and Palmyra Islands.

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ALBACORE TUNA SURVEY IN NORTH PACIFIC BY "CHARLES H. GILBERT" (Cruise 23): An intensive seven-week survey of the albacore tuna in the North Pacific between Hawaii and Alaska was conducted by the Pacific Oceanic Fishery Investigations research vessel Charles H. Gilbert (Cruise 23, September 15-November 2, 1955). Albacore were caught over a broad area approximately 1, 200 miles



Fall albacore tuna survey in North Pacific between Hawaii and Alaska by the research vessel Charles H. Gilbert (Cruise 23). For clarity the northbound leg on 165° W. and southbound leg on 145° W. have been displaced.

north of the Hawaiian Islands. These catches indicate that there has been a migration of the commercially-valuable white-meat tuna into this area since a similar survey in the spring, which showed an almost complete absence of the species.

Albacore abundance was sampled using long lines, gill nets, and trolling lines, and all of these methods caught tuna. The long lines, fishing deep during the daytime, took the largest fish, weighing about 60 pounds each. Albacore taken in the gill nets, which were fished just below the surface and at night, were the smallest, averaging around 7 pounds each. Trolling took medium-size albacore averaging 12 pounds each, and this was the fishing method employed most, as bad weather during part of the cruise made long-lining and gill-netting difficult. Only one albacore school was observed (45°N.. 145 W.).

Of the albacore brought aboard in good condition, 52 were tagged and released for study of their migrations and growth. Recent recaptures in the western and central North Pacific of albacore tagged off the California coast have already given evidence of the great range of the migrations of this species, and recoveries of the fish released by research vessels north of Hawaii would help greatly to clarify the course and seasonal schedule of these Pacific-wide wanderings.

This cruise was one of a series planned to continue through several years. The objectives of these cruises are to study the life history of the albacore in relation to the currents and water masses of the North Pacific and to determine whether or not a profitable commercial fishery for this tuna can be established in the waters north of Hawaii. This study is one of several financed under provisions of the Saltonstall-Kennedy Act.

Trolling with 3 to 8 lines took a total of 64 albacore (fig. 1). Thirteen of the 37 additional strikes were identified as albacore. The best troll catch was made on October 17 on a trolling run between 43°52' N., 144°48' W. and 44°56' N., 144°49' W. when 22 albacore were landed. Except once, no surface signs of fish were seen, e.g., logs, "working" birds, or fish breaking water. The troll-caught albacore ranged in size from 6 to 28 pounds and averaged 12 pounds.

On 165° W. longitude albacore were taken between 42°30' N. and 46°00' N. latitude with surface temperatures ranging from 56° to 60° F. Along 145° W. longitude albacore were taken in a wider latitudinal band extending from 40°00' N. to

46^o00¹ N. latitude with the surface temperatures ranging from 53^o to 66^o F. Inaddition to the albacore, 5 skipjack and 3 dolphin were taken on the trolling lines.

A total of 8 long-line stations was occupied. At each station 40 baskets of 13-hook gear were fished. Only one albacore weighing 58 pounds was taken on the long-line gear at 41 04' N., 164 29' W. The remaining catch on the long-line gear consisted of 5 big-eyed tuna, 18 Alepisaurus sp., 54 great blue shark, 1 mako shark, 8 dolphin, and 1 skipjack.

Gill nets were set on five occasions during the cruise. At each station six shackles (two each of 5-inch, 6-inch, and 7-inch stretched mesh gear) were set at dusk and retrieved at daybreak. Each shackle was 50 fathoms long and 100 meshes deep. A total of 11 albacore ranging in size from 6 to 21 pounds was taken by the gill nets. The highest single catch of 8 albacore was made at 43°22' N., 164°40' W. The rest of the catch by the gill nets consisted of 23 great blue sharks, 2 pomfrets, 1 cuttlefish, and 1 fur seal.

The recording thermograph was run continuously throughout the cruise. Along 165° W. longitude the most drastic change in surface temperature occurred at 42° N. latitude where a drop of 4° F. (65° to 61° F.) was recorded in 10 nautical miles. Along 145° W. the major temperature change occurred at 47° N. latitude where the surface temperature dropped 2° F. (53° to 51° F.) in less than 1 nautical mile.

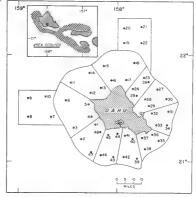
The vertical temperature picture (as obtained with the bathythermograph) showed a very sharp thermocline at approximately 100 feet throughout the northern sections.

* * * * *

SKIPJACK TUNA-SCOUTING TRIP COM-PLETED BY "CHARLES H. GILBERT" (Cruise 24): Two days were spent scouting for skipjack tuna by the Service's research vessel Charles H. Gilbert (Cruise 24, Nov. 14-30, 1955) in each of the following areas with negative results: (1) west and north of Oahu, (2) between Oahu and Lanai, and (3) north of Molokai.

A total of 48 stations were occupied as shown on the chart. Plankton collections, with the one-meter net, were made to a depth of 200 meters (656 feet) at even-numbered stations and to just above the thermocline, which was between 200-300 feet at most stations, at odd-numbered stations.

FERTILITY OF EASTERN TROPICAL

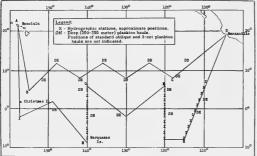


Charles H. Gilbert Cruise 24 (Nov. 14-Nov. 30,

PACIFIC STUDIED BY "HUGH M. SMITH" (Cruise 31): The study of the productivity or fertility of a vast area of the eastern tropical Pacific (Hawaii to Mexico) through observations of the ocean currents, the distribution of oxygen and nutrient chemicals in waters, the amount of plankton and other fish food, and the abundance of tuna schools was the object of the 86-day cruise of the Service's research vessel Hugh M. Smith, which returned to Honolulu on December 17, 1955. The cruise included a bait fish survey in the Marquesas Islands, and a brief stop in the Line Islands. The observations covered an area of the ocean larger than the continental United States. This cruise was part of a series

being conducted jointly by the U. S. Fish and Wildlife Service, Japan, Canada, and private scientific institutions to study the physical oceanography, biological conditions, and other scientific phenomena over wide areas of the Pacific Ocean.

Eight crossings (see chart) of the northern boundary of the counter-current boundary were accomplished on the eastbound leg with bathythermograph lowerings



Cruise 31, Hugh M. Smith, September 27-December 17, 1955.

at 2-hour intervals. Contrary to expectation the location of the current boundary did not show much latitudinal variation (10°30' N. ± 20') over the 2,500 miles that it was followed. The isotherms increased in depth on both sides of the current boundary except in the eastern Pacific where the isotherms instead of dropping remained relatively constant north of the boundary. On the eastbound leg surface samples were collected twice daily for inorganic phosphate and salinity determinations.

Along the northern boundary of the countercurrent a total of 42

closing-net hauls sampling at 3 levels, 42 standard 200-meter oblique hauls, 8 oblique hauls between 200 and 300 meters, and 21 pelagic trawl hauls were completed during this period of the cruise. Zooplankton volumes were found to increase from west to east as far as 123 W. longitude and then drop off. The trawl catches did not vary greatly with longitude.

Thirty-five hydrographic stations were completed during the westbound legs with Nansen bottle casts to either 1,200 or 1,000 meters. Oxygen and inorganic phosphate determinations were made at sea, and water samples were retained for salinity determinations ashore. Bathythermograph lowerings were made on station and at 2-hour intervals between stations. In addition surface phosphate and salinity samples were taken on runs without full hydrographic stations.

During the westbound legs of the cruise a total of 72 closing-nethauls, 80 standard 200-meter oblique hauls, 8 oblique hauls at 200-300 meters, and 33 pelagic trawl hauls were completed. Definite conclusions on the variations in abundance in the equatorial region must await laboratory analysis of the collections.

Each day a plankton station, employing closing-nets sampling at three levels and an open-net sampling between the surface and 200 meters, was occupied just before midday and a similar station was occupied just before midnight. On each day-station a number of incident light measurements were recorded and each station was concluded by Secchi disc and water color observations. Superficial examination of the collections shows that by far the largest volume of plankton was taken near the surface and that it differed in composition from that of lower levels. It was evident that about $1\frac{1}{2}$ to 2 times as much plankton was taken in the night as in the day hauls.

The 746 bathythermograph casts made during the cruise were well distributed across the area of study. As was expected, on the eastbound leg of the cruise along the northern boundary of the countercurrent, the depth to 70° decreased from west to east, from 130 feet at 156° W. to 90 feet at 122° W. and then deepened to 130 feet at 115° W. On the westbound portion of the cruise doming in the isotherms did not always occur on the equator--sometimes it was slightly to the north, sometimes to the south. On two sections the temperature characteristics at the equator suggested an easterly flow. Surface temperature along the equator increased from 69° at 112° W. to 76° at 157° W.

The wheel watch maintained a lookout for tuna schools and bird flocks during all daylight hours that the vessel was under way. A total of 45 schools were sighted, most of which were thought to be skipjack. The insular influence, with its greater bird life and possibly greater fish life, was clearly evident. The number of schools sighted on the eastbound leg between 140° and 120° W. longitude was definitely higher than the average for the open ocean. Surface trolling during daylight hours yielded poor results; the total catch for the cruise consisted of 13 dolphin, 5 wahoo, 2 skipjack, and 2 black skipjack.

Six days were spent in the Marquesas scouting for bait or in running between islands with a lookout for tuna schools and with the surface trolling lines out. Only 4 schools of tuna (2 skipjack and 2 unidentified) were sighted close to the islands.

A small sardine, <u>Harengula vittata</u>, occurs in the bays of the islands, apparently at times in marked abundance, but during the time of our survey it was scarce. With considerable effort we obtained about 130 buckets of these fish which we hoped to bring back for stocking in Hawaiian waters. The majority were lost at sea, however, during rough weather. About 20 buckets of the sardines survived the cruise and were released close-in to the leeward coast of Oahu.

At the beginning of the cruise some excellent records of the evening rise in the scattering layer were obtained with the EDO depth sounder.

With equipment provided by the University of Hawaii, the rate of carbon-14 uptake and plant pigment determinations were made either once or twice daily through the westbound portion of the cruise. The samples were filtered at sea and the millepore filters returned to the labratory for analysis.

A prominent front with 4° F. temperature change was found at $4^{\circ}08^{\circ}N.-120^{\circ}32^{\circ}W$. About 15 hours were spent in the frontal area during which we made 29 bathythermograph casts, 7 surface plankton hauls with a 1-meter net, 1 pelagic trawl haul, and 2 night-light stations.

Morphometric measurements were performed on 5 yellowfin and 2 skipjack caught by surface trolling.

In addition to the regular wheel watch, a 1-hour watch at 1600-1700 hours was maintained each day throughout the cruise and all birds sighted were counted and identified as accurately as was possible. On the westbound leg a similar watch was carried out each morning at 0600-0700 hours.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, SEPTEMBER-DECEMBER 1955: Finfish Research: The work of the Bears Bluff Laboratories fisheries research vessel gave additional information on the time and place of spawning of spot and croaker. Hitherto, during the shrimp survey (begun in December 1952) one croaker was found in spawning condition inshore in St. Helena Sound. A few were noted last winter in 5 and 6 fathoms of water about 3 and 4 miles offshore of Edisto Beach. During November and December 1955, croaker and spot in fair numbers were located some 40 to 45 miles southeast of North Edisto Inlet in 250 feet of water. Practically all these fish were in spawning condition, according to Progress Report No. 26 from Bears Bluff Laboratories at Wadmalaw Island, S. C.

Shrimp Research: In November and December the research vessel made a total of 55 experimental drags, most of which were made at night. Rock shrimp,

Sicyonia brevirostris (30 count, heads off), were taken in abundance in from 27 to 47 fathoms of water. A few large (maximum 8 inches) brown shrimp, Penaeus aztecus, were found in 35 to 40 fathoms. The females had attached spermatophores. The lone male had well developed spermatophores. No white shrimp were found outside the commercial fishing area. The brown shrimp were not numerous enough to be fished commercially.

Salt-Water Ponds: On November 28 and on November 29, two of the one-acre experimental ponds at Bears Bluff were drained and the fish, shrimp, and crabs harvested. These ponds had previously been drained and cleaned out on August 15, 1955. From August 23 to the end of the month, both ponds were restocked with small white shrimp, P. setiferus. In addition, one of the ponds--the oyster pond-was stocked with about 450 mullet, a few spot, and croaker.

November 1955 Shrimp Harvest of Ponds Stocked Latter Part of August 1955								
Item	Fish Pond	Oyster Pond						
Number stocked	1,735	1,747						
Weight of stocked shrimp	198.2 oz.	209.6 oz.						
Number harvested	739	1/757						
Weight of harvested shrimp	568.0 oz.	538.1 oz.						
Mortality	57.4 percent	56.7 percent						
Size increase, length	2 times	2 times						
Weight increase, mass	2.86 times	2.57 times						
Weight increase, individual	6.72 times	5.93 times						
1/ It is possible that of these shrimp 12 were recruits. Counting	1/ It is possible that of these shrimp 12 were recruits. Counting these the mortality could have increased to 57.0 percent.							

Some of the mortality can be attributed to 3 or 4 Hooded Mergansers which continually lived in the ponds from the latter part of October, and to an otter which fished the ponds regularly.

In one of the ponds 10 white shrimp were tagged with Petersen disk tags; were held in cages in the pond until recovery from tagging was insured, and then released. Only one tagged specimen was recovered.

The 446 mullet stocked in the oyster pond weighed a total of 40 pounds. They were from 3 to 7.5 inches in length when stocked. The dominant size was around 4 inches. A total of 216 were recovered on draining the pond on November 28. These weighed 62 lbs. 3.5 oz. Mortality apparently was 52 percent; the increase in length from 1.6 to 2 times the original size. The total actual weight of all mullet recovered was, despite the mortality, 1.55 times that of those stocked. The individual weight increase of the mullet was 3.2 times in the three months period.



United States and Alaska Fisheries Production, 1955

The United States and Alaska 1955 catch of fish and shellfish was estimated about 4.6 billion pounds, a drop of 2 percent from the 4.7 billion pounds caught in 1954. (Catch statistics for fish and crustaceans are based on the weight as caught, while mollusks are reported as the weight of the meats.) The ex-vessel value of the 1955 catch was estimated at about 10 percent less than the \$360 million for 1954. The drop in ex-vessel value was due primarily to the sharp declines in the catches of high-priced species, especially salmon, tuna and halibut. The loss in volume (but not the value) of these varieties was compensated to a great extent by increases in the catches of lower-priced varieties such as whiting, Alaska herring, and a record catch of menhaden.

Menhaden accounted for almost 40 percent of total United States and Alaska catch, which includes nearly 200 items. Menhaden are used for reduction into fish

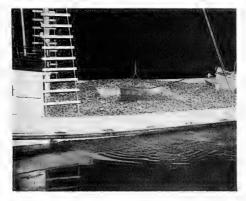
meal and oil. The meal is used in various animal foods and most of the oil is exported to Europe.

The pack of canned salmon in 1955 was 3, 225,000 cases (the lowest pack since 1906), more than 900,000 cases below the 4, 162,000 cases packed in 1954 and only

a little over one-third of the record 8,955,000 cases packed in 1936.

The year saw a record production of fish meal and a good production of fish oils. Production of fish sticks, a recently-created specialty, reached a new high of between 65 million and 70 million pounds, compared with 50 million pounds for 1954, and 7.5 million pounds in 1953 when the production of this product was first undertaken.

Shrimp and haddock fillets, which early in 1955 showed extremely high inventories and a depressed market, are now practically in balance, with demand good and supplies adequate. Special marketing comparing to make the companies to a pro-



Unloading a boatload of menhaden at Pascagoula, Miss. Menhaden accounted for 40 percent of the total United States and Alaska catch.

cial marketing campaigns to move haddock, in which the Fish and Wildlife Service cooperated under provisions of the Saltonstall-Kennedy Act, aided in moving the heavy haddock inventories into consumption channels.

Shrimp is the United States' most valuable fishery on the basis of ex-vessel value. The high inventories which existed early in 1955 had a somewhat adverse effect. The 1955 catch was slightly below that of the previous year and the ex-vessel value was somewhat less than the \$70 million paid in 1954.

The Maine canned sardine pack of 1,300,000 cases was the lowest since 1940 and well under 1954's pack of 2,900,000 cases. The quality of the 1955 pack, however, is considered better than in any recent year due to the small size of the individual fish. The reason for the small catch this year is due to the absence of sardines in Maine waters.

The salmon catch was valued at \$24 million ex-vessel or \$10 million below that of 1954. The catch in 1955 was 286 million pounds as compared with 323 million in 1954.

Halibut landings of 37 million pounds were down 6 million pounds from 1954. In 1955 for a number of weeks during the season bad weather curtailed fishing. This, added to a decline in price, accounts for the drop in ex-vessel value from \$8 million in 1954 to \$5.4 million in 1955.

The catch of tuna was about 20 percent less than the 323 million pounds taken in 1954. The ex-vessel value of the tuna catch, based upon incomplete data, is estimated at \$35 million compared with \$52 million in 1954. During the first 10 months of 1955, about 129 million pounds of frozen tuna and nearly 42 million pounds of canned tuna and tunalike fishes were imported into the United States. In the same period in 1954, there were 111 million pounds of frozen tuna and 41 million pounds of canned tuna and tunalike fishes imported.

U.S. Foreign Trade

GROUNDFISH FILLET IMPORTS DOWN 6 PERCENT IN NOVEMBER 1955: Imports of groundfish fillets (including ocean perch fillets) during November 1955 amounted to 11.1 million pounds as compared to 11.8 million pounds for the corresponding month the previous year, a decrease of 6 percent. (See chart 7 in this issue). The decline was caused primarily by somewhat lower imports from Canada and Iceland. Compared with the same month in 1954, Norway and Denmark also exported less groundfish fillets to the United States during November 1955. Groundfish fillets were also imported from Sweden, the United Kingdom, and France during November 1955, although none were brought in during the same month of 1954 from these countries. The Netherlands, West Germany, and Greenland exported somewhat more fillets to this country in November 1955 than in the same month a year earlier.

Canada continued to lead all other countries exporting groundfish fillets to the United States with 6.5 million pounds during November 1955--7 percent less than during the same month of 1954. Canada accounted for 58 percent of the total groundfish fillet imports during that month.

Groundfish fillet imports into the United States during the first 11 months of 1955 amounted to 124.8 million pounds, compared with nearly 132.0 million pounds during the same period a year earlier. This was a decrease of 5 percent. Canada, with 92.5 million pounds, led all other exporting countries during the 11-months period of 1955, followed by Iceland with 19.8 million pounds. These two countries accounted for 90 percent of the imports for the period.

* * * * *

Products, September 1955 with Comparisons Ouantity Item Sept. Year Sept. Year 1955 1954 1954 1955 1954 1954 (Millions of Lbs.) (Millions of \$) Imports: Fish & shellfish: fresh, frozen, & processed 1/ 58.2 60.3 801.7 16.4 15.3 202.8 Exports: Fish & shellfish:

processed 1/only (excluding fresh

other specialties.

and frozen) 4.1 5.4 50.8

1/Includes pastes, sauces, clam chowder and juice, and

United States Foreign Trade in Edible Fishery

EDIBLE FISHERY PRODUCTS, SEPTEMBER 1955: United States imports of fresh, frozen and processed edible fish and shellfish in September 1955 amounted to 58.2 million pounds (valued at \$16.4 million), according to a U. S. Bureau of the Census summary report (see table). This was a decrease of 18.1 percent in quantity and 11.2 percent in value as compared with August 1955. Compared with a year earlier, September 1955 imports were lower by about 3.5 percent in quantity, but increased 6.3 percent in value.

Exports of processed edible fish and shellfish in September totaled 4.1 million pounds (valued at \$1.7 million), a decrease of 29.3 percent in quantity

but an increase of 5.9 percent in value as compared with August 1955. September 1955 exports were lower by 24.1 percent as compared with the September 1954 exports.

1.7 | 1.3

Wholesale Prices, November 1955

Winter and stormy weather at sea curtailed catches all along the Atlantic and Gulf Coasts, and supplies of fishery products during November 1955 were light. Wholesale prices in that month rose for nearly all types of fishery products except for canned fish, which sold at slightly lower prices. For November 1955 the overall index of edible fish and shellfish (fresh, frozen, and canned) was 112.0 percent of the 1947-49 average (see table)--higher than the previous month's by 4.3 percent and above November 1954 by 8.9 percent.

Table 1 - Wholesale Average Prices and Indexes f	or Edible Fish	and S	Shellfis	h, Novem	ber 1955	With Co	mparis	ons
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Unit Avg. Price		Indexes (1947-49=100)			
			Nov. 1955	Oct. 1955	Nov. 1955	Oct. 1955	Sept. 1955	Nov. 1954
LL FISH & SHELLFISH (Fresh, Frozen, & Canned)		٠			112.0	2/107.4	109.2	102.8
Fresh & Frozen Fishery Products:						2/110.1	113,8	
Drawn, Dressed, or Whole Finfish:	Boston	1b.	.12	10	119.3 125.7		125.0 58.5	115.0
Haddock, Ige., offshore, drawn, fresh	New York	lb.	.27	.32	84.6		133.1	93.4
Salmon, king, Ige, & med., drsd., fresh or froz.	New York	1b.	.60	.60	133.7		140.4	127.
Whitefish, L. Superior, drawn, fresh	Chicago	ıь.	.75	.65	185.9		235.5	154.
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	1b.	.85	.80	171.9		222.4	115.
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.65	.57	132,2	116.8	123.0	128.
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	1b.	.44	.32	102.0	75.1	211.0	82.
Processed, Fresh (Fish & Shellfish):					117.1	108,9	107.8	99.
Fillets, haddock, sml., skins on, 20-lb, tins	Boston	lb.	.36	.30	122.5	102.1	78.3	105.
Shrimp, Ige. (26-30 count), headless, fresh	New York	lb.	.64	.55	100.5		94.5	77.
Oysters, shucked, standards	Norfolk	gal.	5,50	5,50	136.1	136.1	129.9	123.
Processed, Frozen (Fish & Shellfish):					109.7	2/93.3	93,8	88.
Fillets: Flounder (yellowtail), skinless, 1-lb.	Boston	1Ь.	.40	.39	104.7	102.1	102.1	98.
pkg	Boston	lb.	.40	.39	89.5		84.7	91.
Ocean perch, skins on, 1-15, pkg	Boston	1b.	.27	.27	108.8		108.8	109.
Shrimp, lge. (26-30 count), 5-lb. pkg	Chicago	Ъ.	.71	.54	110.0	83,3	84.1	72.
Canned Fishery Products:					102.6	103.4	102.7	96.
Salmon, pink, No.1 tall (16 oz.), 48 can/cs	Seattle	case	21.70	21.70	114.8		114.8	104.
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.),								
48 cans/ cs	Los Angeles	case	12.60	12.80	90.8	92.3	92.3	93.
Sardines, Calif., tom. pack, No. 1 oval (15 oz.),								
48 cans/cs	Los Angeles	case	7,38	7,55	86.1	88.1	88,1	3,
Sardines, Maine, keyless oil, No. 1/4 drawn								
(3-1/4 oz.), 100 cans/cs	New York	case	8,20	8,20	87.3	87.3	81.9	71.

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.
2/Revised.

Except for lower prices on Western halibut and salmon at New York City, November 1955 prices for all other items in the drawn, dressed, or whole finfish subgroup were higher than the previous month and the same month a year earlier. Lighter landings in New England and Middle Atlantic ports were responsible for the limited salt-water finfish supplies available during the month, and stormy weather and closed seasons on the Great Lakes curtailed the supplies of the more popular fresh-water fish. Compared with the previous month, the fresh drawn, dressed or whole finfish subgroup index for November 1955 was 3.2 percent higher than the previous month and the same month in 1954.

^{3/}Not available.

Higher prices prevailed in November 1955 for the processed fresh fish and shell-fish covered in the index, and the subgroup index for this category was 7.5 percent above October 1955 and 17.7 percent higher than in November 1954. Freshhaddock fillets and shrimp prices in November 1955 were substantially higher than the pre-

vious months and for the same month a year earlier.



Retail store in St. Louis, Mo., fluorescently illuminated with tiling and stainless steel trimming throughout, including interior and exterior of cases. Transparent lucite covers on cases.

The limited supplies of fresh fish and shellfish increased the demand for frozen fish and shellfish and November 1955 prices for frozen processed fishery products were up 17.6 percent from October 1955 levels and 23.4 percent above November 1954 prices. Stormy weather in the Gulf limited the operations of the shrimp fleet and shrimp catches were generally light, but good catches by the Mexican west coast shrimp fleet offset to some extent the shortage of Gulf shrimp. From October to November frozen shrimp prices at Chicago went up 32.1 percent and were 51.7 percent higher than during the same period a year earlier. Fro-

zen fillet stocks were only moderate and demand was good, and in some instances supplies of frozen haddock and cod fillets were not considered adequate to meet the demand.

Ample supplies of canned tuna and California sardines and a moderate demand were responsible for the lower shading in prices which took place during the month. November 1955 canned tuna prices were 2.4 percent lower than in the same month in 1954. The subgroup index for all canned fish from October to November dropped 0.8 percent, but was still 6.0 percent higher than in the same period a year earlier because of higher prices for the limited supplies of canned salmon and canned Maine sardines. Tuna and sardine catches on the West Coast were reported good. The shore workers-cannery management dispute, which had practically closed down tuna and sardine canning for more than a month, was settled on October 31 and the canneries were packing full time again in November.



ACID-PRESERVED FISH SCRAP

Ensilage prepared from cod and haddock and preserved by $\rm H_2SO_4$ has been fed successfully to pigs and chickens in Nova Scotia, Canada.

-- Trade News (Canadian), January 1955.



International

GENERAL AGREEMENT ON TARIFFS AND TRADE

REVIEW OF TENTH SESSION: The Tenth Session of the Contracting Parties to the General Agreement on Tariffs and Trade produced encouraging indications that foreign governments are cooperating in the reduction of restrictions against United States goods which have been in use for balance-of-payment reasons. Discussions at the Tenth Session pointed up the fact that such restrictions have been significantly reduced during the current year, the U. S. Department of State announced on December 7, 1955. This was one of the principal points in a summary of the Session released in December. Other activities of the Session of general interest include the completion of plans for further tariff negotiations beginning in January 1956 and the initiation of discussions looking towards the lifting of the reservations which some countries placed upon their trading relations with Japan at her recent accession to the Agreement.

The Session was held at Geneva, Switzerland, from October 27 through December 3, 1955. The United States delegation, headed by United States Ambassador to Portugal, consisted of representatives of the Departments of Treasury, Agriculture, Commerce, and State.

Countries which have been restricting imports from other countries because of shortages of the currencies needed to pay for them are tending more generally to employ internal fiscal and economic measures, rather than import restrictions, to relieve pressure on-their foreign exchange reserves. These measures include such actions as raising interest rates and tightening installment credit, thus dampening the demand for imports and making more domestic goods available for export.

A number of trade difficulties between individual countries, referred to the Contracting Parties under the "complaints" procedure of the Agreement, were satisfactorily settled. Another important development was a renewed request by the Contracting Parties that France move more rapidly towards the elimination of certain taxes upon imports.

Tariff Negotiations: Arrangements were concluded during the Tenth Session for a "Fourth Round" of tariff negotiations to be held in Geneva beginning in January 1956. The three previous rounds of negotiations were held at Geneva in 1947, at Annecy, France, in 1949, and at Torquay, England, in 1950-51.

Japanese Accession: The Contracting Parties discussed the problem created by the fact that, upon the accession of Japan to the Agreement last September, 14 countries exercised their right to refuse to apply the Agreement between themselves and Japan. The issue was discussed both in the regular meeting and in private consultations between interested countries, in an effort to work to

ward a solution. The United States Delegation urged the other countries to extend the full benefits of the Agreement to Japan in order to expand export opportunities for Japanese goods. The problem will be kept under continuous study by all countries in the Agreement, and will be taken up again at intersessional meetings and at the Eleventh Session.

Balance-of-Payments Consultations: The Contracting Parties, with the assistance of the International Monetary Fund, held a number of consultations with participating countries that are applying restrictions on imports for the purpose of dealing with balance-of-payments difficulties. Australia, Ceylon, New Zealand, the Federation of

Rhodesia and Nyasaland, and the United Kingdom consulted on their import restrictions against dollar goods, as is required annually by the Agreement.

Consultations on Special U. S. Problems: The United States used the opportunity afforded by the Tenth Session to discuss informally with a number of countries some specific trade problems caused by the balance-of-payments restrictions which they have placed on imports from the United States. Such informal talks were held with the United Kingdom, the Federal Republic of Germany, France, Italy, Sweden, Norway, Austria, Finland, and Brazil. It is expected that these consultations will result in the easing of restrictions on particular commodities in a number of these countries.

Transport Insurance: Another noteworthy action by the Contracting Parties at the Tenth Session was the drafting of a resolution calling for the elimination of governmental restrictions which limit the freedom of buyers and sellers of goods to place transport insurance on the most economical basis. Such restrictions increase the cost of goods figuring in international trade and may create obstacles to trade.

The proposed resolution will be considered by governments during the coming year with a view to possible action at the Eleventh Session It recom-

mends that governments avoid measures in the transport insurance field which have a restrictive effect on international trade and that governments now having such measures eliminate them as rapidly as circumstances permit. The resolution also requests that governments report on actions taken to eliminate such measures.

Status of Ninth Session Actions: During the session, governments reported on the status of their plans for accepting the Agreement on the Organization for Trade Cooperation (OTC) and the several protocols of amendments of the General Agreement which were drawn up at the Ninth Session. These instruments must be formally accepted by a prescribed majority of the Contracting Parties before they will enter into force. The United States Delegate reported that the United States has accepted the protocols of amendments to the General Agreement and that President Eisenhower has submitted the Agreement on the OTC to the Congress with a strong message of endorsement and the recommendation that legislation be enacted authorizing United States membership in the organization.

The Next Session: The Contracting Parties agreed to hold their Eleventh Session at Geneva beginning October 11, 1956.

TERRITORIAL WATERS

THIRD MEETING BY PERU, CHILE, AND ECUADOR ON TERRITORIAL WATERS: The Third Ordinary Meeting of the Permanent Commission for the Conservation and Exploitation of the Maritime Riches of the Southern Pacific was held at Quito, Ecuador, December 12-16, 1955. The Commission, composed of representatives of Ecuador, Chile, and Peru, with an observer from Costa Rica, took up technical and administrative questions but failed to go into the broader aspects of the 200-mile limit. The principal accomplishments of the meeting were agreements to exchange information, and the setting up of whaling quotas for the waters claimed by Ecuador, Chile, and Peru.

The Commission, which is composed of the three countries mentioned, is the result of a joint declaration by these countries signed in 1952 at Santiago claiming their sovereignty over a maritime zone 200 miles seaward from their coast. Costa Rica has since adhered to the declaration. At that time a permanent commission was created to meet periodically for the discussion of technical questions arising from the 200-mile claim.



Australia

NEW TUNA PRODUCTS INTRODUCED: A new factory for processing tuna into tuna chicken and smoked tuna-ham has been established in what was formerly a cargo shed at Bermagui on the south coast of New South Wales. If the products find favor with the Australian consumers, the new enterprise could utilize all of the current catch of tuna, according to the November 1955 Fisheries Newsletter, a publication of Australia's Commonwealth Director of Fisheries. Samples of the two solidmeat tuna products (which are cooked and ready to eat cold) inspected by the Australian Fisheries Office were attractive in taste and appearance.

The cargo shed has been rebuilt, with a cooking and a prefabricated refrigeration plant installed. The factory consists mainly of steam cooking and smoking rooms, plus freezing chamber and cold-storage equipment.

The initial processing plant can handle five tons of round fish daily. After fish have been filleted, the meat which is to become tuna chicken goes through a special preliminary processing and is then steam-retort cooked. Cooking time is less than the usual precook for canning, and this is claimed to retain more of the original flavors of the tuna. After cooking, the "chicken" is cooled, then frozen. The smoking of the ham is controlled by a system of air circulation and pressure, enabling accurate control of the process.

The factory is producing only on a sampling scale, but the manager hopes to be in commercial production by the end of October. The company plans to market the two products through distributors and is presently packing them in 28-lb. cartons, lined with greaseproof paper, but may later market an individual retail pack in cellophane. The ceiling retail price should be not more than about 45 U. S. cents per pound for the smoked ham and slightly less for the "chicken." The new firm is paying tuna fishermen about 6.5 U. S. cents a pound.



Brazil

SPINY LOBSTER FISHERY IN NORTHEASTERN BRAZIL: Spiny or rock lobsters are found in quantity off the coasts of the States of Ceara, Rio Grande do Norte,



Spiny lobster (Panulirus argus)

Paraiba, and Pernambuco, or the area called the "Bulge" of Brazil. The Latin names of the spiny lobsters caught in these waters are: Panulirus guttatus, P. Argus, and P. Laevicauda. The common Portuguese term for all is "Lagosta," according to an October 26 dispatch from the United States Consul at Recife. The production and marketing of spiny lobster in Northeast Brazil is still relatively unorganized, and the techniques employed are primitive. The spiny lobsters are caught in basketlike traps, and most of the fishermen operate from balsa rafts called "Jangadas," although some waders with torches work off the inshore reefs at night.

The spiny lobster season lasts from September through February, and most of the catch is either sold locally or shipped cooked to Rio de Janeiro or Sao Paulo. There is also one small packing plant which cans a limited quantity of spiny lobster for sale

within Brazil, and there have been some recent experiments with shipping chilled spiny lobster tails. The total quantity of spiny lobster entering commercial channels in Northeast Brazil is estimated to be about 80 metric tons per year. Consumption in the Northeast is relatively small, as no popular taste for lobster has been developed in this region. Americans and Europeans living in Brazil are the principal consumers of Brazilian spiny lobsters. Restaurant prices for spiny lobster in Sao Paulo and Rio de Janeiro are very high, but opinions differ widely as to whether or not the market there could be substantially expanded, with liberal shipments of fresh tails at more reasonable prices. Live spiny lobsters sell for only a few cruzeiros per kilogram in the more remote fishing villages in Northeast Brazil.

There are no freezing facilities in Northeastern Brazil and it will be necessary for any firm entering the lobster business there to construct its own freezer. Nearly all spiny lobster fishing in the Northeast is done by highly independent fishermen operating their own balsa rafts. These men are probably unprepared to provide a steady supply of large quantities of fresh spiny lobster, although they might be able to expand their present output considerably on occasion.



Canada

NEWFOUNDLAND'S ECONOMIC FISHERIES PROSPECTS PRESENTED TO ROYAL COMMISSION: Among numerous other natural and cultural resources needing Federal assistance, the case of fisheries was presented to the Royal Commission of Canada by the Premier of Newfoundland. Prior to the beginning of the 20th Century, fishing was about the only industry that played an important part in the settlement, communications, and living standards of "Canada's poorest Province." Since then other industries, such as mining and forestry, have played a more important part in the economy of Newfoundland, according to a November 16 dispatch from the United States Consul at St. John's, Newfoundland.

The Premier is more optimistic over the fisheries prospects than most Newfoundlanders. In his October 18 speech he belittled the approaches made by most statesmen to the problem of the depressed fisheries. Most politicians, he said, can offer nothing more constructive than suggestions that the fishermen seek work on the American bases or go to Ontario as carpenter apprentices. The Premier asserted that the fisheries have a potential "greater than can be grasped by any living man." During the First World War over 40,000 men were engaged in the inshore fishery. In 1951 there were 19,000 so employed, and by 1954 that number had declined to about 16,700 men. The reasons for the diversion of workers from the sea are to be found in the declining market for salt-dried cod and the consequent failure of salt-cod prices to assure the fishermen even as much as their old low standard of living.

Newfoundland's market has shifted, for currency and tariff reasons, from the European to the Caribbean area. The elastic demand in this latter area precludes any significant price rise, so that the only possible improvement in the Newfoundland fishing program would lie with a cut in the cost of production. If the United States and Canadian market for cod in frozen form were capable of considerably greater expansion than now seems possible and if the United States duty on frozen fish sticks had not been raised to $33\frac{1}{3}$ percent recently, the transition in types as well as location of markets might be made more easily. The Government's brief sees the lack of refrigeration and population increases in the tropical Catholic countries as a saving consideration for the salt-cod industry, if, at the same time, exchange rates become favorable enough to the Latin countries to make their demand for cod effective. Portugal and Spain remain potential markets for Newfoundland fish, since neither country produces enough for its own needs, but as long as the dollar value of cod keeps it out of their reach and if Newfoundland fishermen cannot cut their costs, the European market is uncertain.

The Premier makes no suggestion to the Federal Government and outlines no program for the Provincial Government. The future of cod fishing hangs on the success of artificial drying of fish (hopefully a cost-cutter), a larger slice of the North American frozen fish market, and tariff and exchange rates favorable to Latin consumers.

The Premier concludes that the biggest economic problem facing the Province is the condition of the fishery. The goal here is to raise the productivity of the

inshore fishermen, then to expand the market for frozen fish to take care of the planned capacity of 100,000,000 pounds annually. The Government makes no request for Federal aid and does not mention Federal unemployment insurance for fishermen.

* * * * *

 $\underline{GROWTH} \, \underline{OF} \, \underline{THE} \, \underline{FISH} \, \underline{STICK} \, \underline{INDUSTRY} \colon \, In \, Canada \, there \, are \, 7 \, to \, 8 \, plants \, producing \, fish \, sticks \, , \, and \, their \, production \, in \, 1954 \, amounted \, to \, 1.6 \, million \, pounds \, of \, sticks \, .$

Some 25 plants on both the Atlantic and Pacific coasts, with the main volume concentrated in the former area produced 33,3 million pounds of blocks or slabs (the raw material utilized in producing fish sticks) in 1954. However, a large proportion of the blocks and slabs are exported to United States plants for processing into fish sticks.

In 1955 the expansion of the production of fish sticks and blocks and slabs continued. Production of fish sticks for the first eight months of 1955 reached 3.9 million pounds as against 1.1 million pounds for the same period of 1954. January-August 1955 production of blocks and slabs totaled 32.6 million pounds as compared with 17 million pounds for the same period in 1954, the November 1955 <u>Trade News</u> of the Canadian Department of Fisheries points out.

The expansion in fish stick production in both the United States and Canada raises the inevitable question of the effect of the new product on fish consumption in general, and upon the traditional fillet form in particular. Estimates would suggest that in Canada while there has been a strong consumer demand for fish sticks as well as an obvious need for filling the marketing "pipeline" from processor through to the retail outlet, there has been little or no increase in over-all consumption of fish products effected as a result of the new products.

While it is not possible to estimate accurately the impact of fish sticks in the Canadian domestic market, it is fair to assume that use of the product by Canadian housewives may have been somewhat slower than in the United States, but that the pattern of consumption will tend to follow that in the United States as supplies become more widely available and adequate refrigerated storage facilities increase.

Fish sticks in Canada are produced from a number of species of sea fish of Atlantic or Pacific origin as well as from certain species of fish from inland waters. However, Canada groundfish, principally cod and haddock, are the species most frequently used in the preparation of sticks.

Up to the present the Canadian fishing industry, as is the case with the industry in both Norway and Iceland, has developed as a supplier of the raw product--blocks and slabs. Fish sticks as such are produced almost entirely for the domestic market. The United States import duties on cooked and uncooked fish sticks have served effectively to bar the Canadian finished product from markets in that country.

* * * * *

NEW LABELING REGULATIONS PROPOSED FOR FISHERY PRODUCTS: The following amendment to Section 59 of the Canadian Fish Inspection Act has been proposed by the Department of Fisheries for implementation effective March 1, 1956, according to the November 4 Bulletin of the Fisheries Council of Canada.

SECTION 59: $\underline{1}$ All containers and wrappers in which fresh or frozen or processed fish is packed shall be correctly and legibly marked or labeled to indicate the following:

a. the vernacular (common) name of the fish.

- b. the minimum net weight of the contents or the words "to be weighed at time of sale,"
- c. the name and address of the person, firm, or corporation by whom or for whom they are produced and packed or by whom they are distributed, and
- d. the words "Product of Canada."
- $\underline{2}$ Marking or labeling prescribed by subsections 1 (a) and 1 (b) shall be not less than $\frac{3}{16}$ inch in height and shall appear on the main body or face of the wrapper.
- <u>3</u> No person shall mark, label, or package any fresh, frozen or processed fish in a manner that is false, misleading, or deceptive.

 Note: By "fish" is meant all fish and shellfish products.



FISH CANNERY FINANCES HERRING EXPLORATORY FISHING: The Barran-quilla cannery, one of two fish canneries operating on the Caribbean coast of Colombia, recently financed a seven-day experimental trip by a California fishing vessel off the northern coast between Cartagena and Santa Marta, a December 6 United States Embassy dispatch from Bogota states. The California purse-seiner was sent out primarily for the local "flat herring" which this cannery cans as sardines.

The trip was not successful since only about 400 pounds of fish were caught, although several large schools were spotted which for various reasons could not be encircled.

Both the Barranquilla cannery and the other at Santa Marta have been entirely dependent on the very uneven supply provided by local fishermen using cast nets and similar primitive gear. Except for the heavy mullet season, running from October-January, the canneries operate at a small fraction of capacity and must resort to such unprofitable expedients as packing other types of products to keep going. The Barranquilla cannery can handle 15 metric tons of raw material a day.

The price of the canneries' output is high-68 U.S. cents retail for the 15-ounce oval can of sardines. Therefore, the Barranquilla cannery was able to offer the California vessel \$140 a ton for the fish caught.

The failure of the experiment is attributed primarily to insufficient knowledge of local conditions, waters, and fish habitats, and to insufficient capital to finance the necessary extensive exploration.

Discouraged by their long and fruitless efforts to establish a profitable business on the Caribbean coast of Colombia, the operators of the Barranquilla cannery recently opened a plant in Tumaco on the southern Pacific coast where they will endeavor to contract with the Pacific tuna fleet for supplies of fish. Should this be successful, the Barranquilla cannery will be closed down except during the mullet season.

It is understood that the Government is preparing a decree on the promotion of the fish industry in line with the recommendations made by a Spanish Food and Agriculture Organization expert who recently visited Colombia. However, it is not yet known whether these recommendations include provisions for an exploratory vessel.



Denmark

INTERNATIONAL FISHERIES FAIR TO BE HELD IN COPENHAGEN: An International Fishery Trade Fair will be held in Copenhagen May 18-27, 1956. Arrangements are in the hands of Universal Fair and Exhibition Service A/S, Copenhagen. This is the first fair of its kind in Denmark.

It is expected that exhibits will be held in the Forum building and in several other buildings in the harbor area. The Danish Ministers of Fisheries and of Commerce have agreed to act as patrons and advisers, together with representatives of other Danish organizations, both official and unofficial, which are concerned with fishing and fish trading and processing.

It is hoped to attract exhibitors from most European countries and negotiations for official exhibits are also said to be in progress, states a December 15, 1955 dispatch from the United States Embassy at Copenhagen.



Ecuador

FISH AND SHELLFISH EXPORTS, 1954--CORRECTION: In the October 1955 issue of Commercial Fisheries Review, the table "Ecuadoran Fish and Shellfish Exports, 1954" shows live spiny lobster exports to the United States, Panama, and Peru. It is believed from information now available that the data are for fresh and frozen shrimp instead of spiny lobsters.



El Salvador

NEW MARINE FISHING LAW ISSUED: In 1955 El Salvador issued a new marine fishing and hunting law (Legislative Decree No. 1961), which primarily establishes legal procedures and sets up processes for starting a fishing company. This new law is restricted to the actual fishing operations (all other aspects of the industry are regulated by a law for the development of industry--Legislative Decree 661), reports the United States Operations Mission to El Salvador.

Under the new law, the Ministry of Economy will regulate the marine fisheries for exploitation, domestic consumption, sport, and mixed fishing, for home use and for sale, and voids all previous legislation in conflict with the law. The general regulations of a marine fishery are now being prepared and will be issued in the form of a Ministerial decree.

Article 6, II, permits up to 50-percent investment of foreign capital in a Salvadorean fishing company. The next article (Article 7) lists the privileges granted under the law for a period of five years after its passage to companies going into fishing. After the five-year period, fishing companies will be subject to the regular taxes, import duties, and other contributions of ordinary business concerns.

All fishing vessels operating in Salvadorean waters must be of Salvadorean registry (Art.16). This means they will have to belong to a Salvadorean company, which may have up to 50-percent foreign investment. Reports indicate that the question of tuna clippers obtaining a license to fish for bait in Salvadorean waters has been referred to a special law which will be passed at a later date.

Article 18 of the new law provides for fines of from US\$2,000 to US\$6,000 for fishing in Salvadorean waters without the proper permission. (The constitution of 1950 designates 200 miles as the offshore limits of Salvadorean territory.)



German Federal Republic

SEAWEED FLOUR: A German scientist, Heinrich Lienau of Flensburg, has started producing bread containing a small percentage of seaweed flour ("Algenbrot"), reports a December 6 dispatch from the United States Consulate at Hamburg. Lienau has been experimenting for decades with the utilization of seaweeds as fodder, and he now reports that he has been able to use certain kinds of seaweeds for human food. The experiments were started in Iceland, but World War II interrupted them. Lienau later started to work with seaweeds again in Germany after the war.

A special treatment is used to clean the seaweeds (Phaeophyceen) of parasites, shells, etc. To remove the excessive salinity, the seaweeds are washed in fresh water, dried, and coarse-ground. This product is packed in strong paper bags of 110 pounds each and sent to Hamburg where the coarse-ground seaweed is specially ground to prepare the product for mixing with common bread flour. Seaweed flour, which can be mixed with rye flour, wheat flour, and any other type of flour, is shipped to the bakeries in 100-pound paper sacks. Generally, 2 percent of the seaweed flour (soaked in milk or water until a gritlike paste is obtained) is kneaded into the bread dough. The percentage of seaweed flour may be increased according to taste and moisture content, but not more than 8 percent can be added otherwise a peculiar flavor is imparted to the bread, according to Lienau. It is reported that the nutritive value of the bread is improved by adding seaweed flour since it contains essential nutritive elements, vitamins, and trace elements missing in grain. The seaweed flour can absorb great quantities of moisture, and the bread is spongy. The bread with seaweed flour keeps longer than regular bread. Although a sea odor is observed when the bread is baking, the odor disappears when the bread is

Algenbrot besides being produced in Germany is also made in Belgium where sales are reported increasing. Production of this bread was also recently started in Austria.



Iceland

RUSSIAN-ICELANDIC TRADE AGREEMENT, 1956: Negotiations between Soviet Russia and Iceland towards a Trade Protocol for the calendar year 1956

Under 1954 & 1955 Agreements Estimated Value f.o.b. Item 1955 Agreement 1954 Agreement US\$1,000 US\$1.000 Fish fillets, frozen... 8,173 7,011 Herring, frozen 166 Herring, salted 2,337 3,506 Unclassified 246 123 10,922 10,640

Estimated Icelandic Exports of Fishery Products to Russia

agreed to supply Russia with a substantial amount of fishery products.

were completed. The agreement was amended to include a provision for an increase in the overdraft authority from about US\$615,000 to US\$1,230,000. In exchange for various nonfishery products produced by Russia. the Icelanders have

The agreement for 1956 includes the shipment of 20,000 metric tons of frozen fish fillets and 15,000 tons of salt herring plus miscellaneous products (some other fish products may be included in this category).

The dispatch also states that large-scale shipments of fishery products to Russia in November 1955 have helped to relieve the rather critical shortage of cold-storage space in Iceland. Cold-storage space in Iceland had become so short before November that quantities of fresh ocean perch were diverted to the reduction plants.

Agreement has now been reached for the U.S.S.R. to take a final 3,000 tons of frozen fish fillets under the 1954 agreement, but the Russians were unable to agree to take the final 2,000 tons which would have completely taken up the optional quantity specified under the agreement.



Indonesia

SHRIMP FISHERIES: Statistics on the catch of shrimp in Indonesian waters are incomplete, according to a dispatch from the U. S. Operations Mission to Indonesia. Catch data are available from fishery centers that have fish auctions, but it is believed that 15 percent or more bypass the auctions. The shrimp fisheries are extensive and widely scattered and many fishing villages are isolated, so that for many areas statistics are entirely lacking.

Estimated production in 1954 for the islands of Java and Madura are: "Rebon" (immature shrimp less than 1 inch long) 4,347,000 pounds and "Udang" (mature, more than 1 inch long) 957,000 pounds. The immature shrimp are used primarily in the preparation of fermented pastes.

The report states that the shrimp fishery potential is apparently unlimited, since extensive areas of marshland adjacent to the coasts of Sumatra, Java, and Kalimantu, with corresponding trawlable bottom offshore, are known to support shrimp populations. These resources are virtually unexploited at the present time. Local demand for shrimp is good and is probably limited only by price.

The amount of shrimp that is exported is unknown although there is an extensive but unknown trade between certain fishery centers adjacent to the Malay States, with shrimp products probably included in this trade. Fermented shrimp paste ("trasse") is one of the important products exported.

The lack of canning and freezing facilities, and the improbability of their being installed in the near future, indicate that Indonesia has no immediate prospects of becoming an important factor in the international trade for shrimp or other seafoods.

The Indonesians catch considerable quantities of shrimp in brackish-water ponds (used primarily for Chanos chanos culture); juvenile with a "sodo" (a scoop net pushed by hand in shallow water); with weirs and traps; with a sort of fyke net operated in river mouths and elsewhere in strong current; and reportedly with hand lines (for very large shrimp). There is no trawl fishery for shrimp at present.

A large part of the shrimp catch is processed to fermented pastes such as "trasse;" quantities are made into a dough with sago flour, cooked, and dried for later deep-fat frying to make a sort of shrimp chip. There is also a large market for fresh shrimp. The predominant type of shrimp is $\underline{\text{Penaeus}}$ sp., with the size ranging from $\frac{1}{2}$ inch to 14 inches or more.



Japan

<u>DEVELOPING GOOD TUNA FISHERY IN INDIAN OCEAN:</u> The tuna fishing in the Western Indian Ocean, developed by Japanese long-line fishermen, is yielding catches of 12-14 yellowfin per 100 hooks. This is a much higher catch rate than on any other grounds fished by the long-liners.

The Nankai Regional Fishery Research Laboratory, the Japanese government agency most active in tuna research, is planning to investigate oceanography and tuna ecology on the long-line grounds of the Indian Ocean. The expedition, which will be made in cooperation with the fisheries department of the University of Kagoshima, is using the University's training ship Keiten Maru (510 tons). The training ship was scheduled to sail January 4 and return about the middle of March, according to Nippon Suisan Shimbun, a Japanese trade publication.

On December 3, 1955, the $\underline{\text{No}}$. $\underline{2}$ Seiju $\underline{\text{Maru}}$ (750 tons) returned to the port of Shimizu, Japan, with a full load of 425 tons of yellowfin and big-eyed tuna after an 80-day voyage that extended across the Indian Ocean to the vicinity of the African coast. The average day's catch was reported as about 12 tons of yellowfin. It is said that 70 percent of the catch passed inspection as suitable for export, that the proceeds of the voyage will amount to about US\$90,000, and that crew members will receive about US\$275 each for the trip.

In addition, the large tuna mothership $\underline{\text{No}}$. $\underline{21}$ $\underline{\text{Kuroshio}}$ $\underline{\text{Maru}}$ (1,858 tons) returned on December 4, 1955, from the new fishing grounds in the Arabian Sea region with 1,063 tons of fish, valued at over \$160,000. About 70 percent of this catch was slated to be canned for export. On December 18 the $\underline{\text{Kuroshio}}$ $\underline{\text{Maru}}$ again sailed for the fishing grounds off Somaliland and Madagascar.

* * * * *

LONG-LINING FOR SALMON PROPOSED: Fishermen of northern Japan, eager to enter the profitable northern salmon drift-net fishery but prevented from doing so by the Japanese Fisheries Agency's strict limitation on the number of licenses, are planning to try long-lining for salmon on the northern grounds. Under present regulations it is considered that this would be an open unlimited fishery. Basic studies of the method are being made by the Fukushima Prefecture Fishery Experiment Station, states the Japanese trade publication, Nippon Suisan Shimbun.

* * * * *

LONG-LINER PRESERVES TUNA BY "AIR FREEZING": The new tuna boat, the Jingu Maru (499 tons), returned to port in Japan on December 3, 1955, from its maiden voyage with 330 tons of fish preserved by "air freezing," a method of preservation that is used aboard the tuna motherships but which was being tried for the first time aboard a Japanese tuna long-line boat. The greater part of the load was in such a good state of freshness that it was suitable for consumption as fresh raw fish, despite the 4 months' duration of the voyage. This success is attracting much attention at Misaki, where it is considered an epoch-making development, the Japanese trade publication Nippon Suisan Shimbun reports.



Mexico

REVIEW OF FISHING INDUSTRY, 1953-55: Catch: According to statistics compiled by the Fishing Office of the Ministry of the Navy, fish and shellfish catches in Mexican waters (including the fish caught by United States and other foreign vessels) reached a peak of 140,548 metric tons in 1951, and in the subsequent three years has varied

				1 1050	- 1		
Table 1 - Catch	of Fish a	and Shelli	fish in Mexican Waters,	1/ 1953-			
Species	1954	1953	Species	1954	1953		
	(Metri	c Tons)			ic Tons)		
Albacore tuna	995	1,905	Mullet 1/	1,757	909		
Skipjack tuna	8,471	6,177	Shrimp -/	20,061	19,671		
Other tuna	36,764	47,883	Oysters	7,235	6,883		
Bonito	440	1,252	Abalone	1,528	1,626		
Yellowtail	945	1,210	Lobster, spiny	1,111	1,033		
Sardines	5,553	4,717	Crabs	651			
Grouperlike fishes	3,286	3,497	Clams	377	783		
Sea bass (robalo)	2,567	2,662	Turtles	298	263		
Sierra	1,891	2,514	All other fish 2/				
Corvina	1,253	920	and shellfish 2'				
(Continued in opposite column)			Grand total	108,717	116,027		
1/ Includes fish caught by United States fishing vessels in Mexican waters.							
7/ Includes about 100 energies of fish and shellfish							

2/ Includes about 100 species of fish and shellfish.

less than 5 percent from the average annual catch of 110,848 tons. The principal volume items, shrimp and tuna, accounted for over half of the total in 1954 (table 1). Catch statistics for 1955 are not yet available, but the shrimp catch is understood

to be very satisfactory for that year off both coasts. The tuna catch, however, declined 25 percent from 1953 to 1954 and probably declined further in 1955. Most of the tuna is caught by United States fishing vessels operating out of Southern California. The 1955 spiny lobster catch is thought to have been moderately greater than in previous years, according to a December 14, 1955, report from the United States Embassy at Mexico City.

Table 2 - Canned Fish and Shellfish Pack							
in Baja California, 1953							
(4 principal canno							
Kind	Quantity						
	(Metric Tons)						
Abalone	1,307						
Anchoveta	40						
Corvina	11						
Mackerel	744						
Sardines	7,123						
Skipjack tuna	120						
Tuna	141						
Total	8,486						

The "red tide" caused some anxiety in October in the area below Tampico to the base of the Yucatan peninsula, but did not hamper fishing operations seriously.

Foreign Trade: The volume of exports in 1954 declined about 4 percent from the previous year, but the value of exports in terms of pesos rose 18 percent, according to Ministry of Economy statistics. The increase in value reflects a rise in peso quotations after the 44.5 percent devaluation of the peso in April 1954. Frozen shrimp represented 83 percent of the value of seafood exports in 1954. Export statistics through September 1955 show an increase over the same period of 1954 of 17 percent in the volume of shrimp exports and an increase of 9.6 percent in value. The figures for shrimp exports in the first nine months of 1955 are 12,029 metric tons, valued at US\$8,294,635.

Imports declined by 16 percent in total volume from 1953 to 1954, although the value in pesos increased slightly. The United States supplied less than 6 percent of the value of total imports. These imports, which were valued at less than 6 percent of Mexican exports of seafood, consisted primarily of dried cod and salted or smoked fish of unspecified species.

can-caught fish.

<u>Prices</u>: Although tuna is the most important catch in Mexican waters, this fish is not exported in significant quantities by Mexican packing companies. The whole-

Table 3 - Mexican Fishery Byproducts Production, 1953-54									
Product	Quantity								
Product	1954	1953							
	(Metr	ic Tons)							
Marine Oils:									
Whale	6.2	-							
Swordfish	2.8	1.6							
Shark-liver	15.9	10.5							
Other	263.7	163.7							
Algae gelidium	75.0	142.8							
Other algae	121.3	36.5							
Shells:									
Abalone	188.3	119.7							
Oyster	59.0	40.6							
River	216.9	15.2							
Nacre	32.4	7.4							
Other	10.4	10.4							
Sponges	0.2	-							
Fertilizer materials	2,316.5	1,356.6							
Shark livers	100.6	101.4							

sale price of canned tuna in Mexico City is US\$12 per case of 48 cans, each can weighing approximately 7 ozs. United States fishing vessels catch considerable tuna in Mexican waters; such tuna appears in Mexican production statistics, but not in the export statistics.

The value of frozen shrimp exports greatly exceeds the value of all other fish and shellfish exports. The American Consulate in Merida, Yucatan, reports that the average prices at Brownsville, Tex., during the third quarter of 1955 for frozen 15-20 count brown shrimp for primary sellers were as follows: July 66 U. S. cents, August 62 U. S. cents, and September 60 U. S. cents.

Canned abalone has been the second most important export product in

recent years. A leading canner quotes a case of 48 No. 1 cans at about US\$20 f.o.b. San Diego, Calif. Most of this canned abalone is transhipped to the Orient.

	to Of Pibli	and Sheimi	sh, 1953-54				
Commodity	Quai	ntity		Value			
Commodity	1954	1953	1954	1953			
	(1,000]	Pounds)	(Equiv.in	US\$1,000)			
Inprocessed fresh:							
Clams	335	1,213	12.5	67.2			
Turtles	324	326	2.6	3.8			
Processed:							
Fish fillets	487	428	33.1	40.3			
Fish, fresh, refrig., frozen	7,427	5,229	482.6	432.1			
Fish, dry, salted or smoked	82	351	5.0	110.7			
Lobster, spiny, cooked	1,870	1,766	624.2	501.6			
Frog legs	9	15	1.8	2.8			
Crustaceans	-	7	_	0.5			
Shrimp, dried	22	4	4.9	1.4			
Shrimp, fresh or refrigerated	331	335	96.0	104.3			
Shrimp, frozen	33,631	35,311	11,255.6	14,019.2			
Mollusks	-	40		2.7			
Canned:							
Abalone	3,419	4,894	1,103.0	1,536.9			
Shrimp	13	26	3.9	11.3			
Lobster, spiny	2	2	0.2	0.2			
Oysters		2		0.6			
Sardines	2		0.4				
Other	g	9	2.3	3.1			
Total Exports	47 963	49,959	13,628.1	16,838.7			
Exports to U. S	47 450	49,456	13,577.6	16,678.6			
Note: It is believed that in 1952 and earlier years very s	ubstantial expo	rts of fresh, refr	igerated, or frozen				
the catch in Mexican waters of United States fishing ves	ssels, but in 195	3 and 1954 statis	rics included only	exports of Mex			

Canned spiny lobster has been the third most important export product in recent years. A trade source states that a lobster company in Ensenada, Baja California, is the



A typical Mexican shrimp trawler.

sole exporter in that area by agreement with the Banco de Fomento Cooperative. Recent average prices of frozen spiny lobsters landed in San Diego are understood to be about 70 U.S. cents per pound. The current wholesale price of fresh lobster in Mexico City varies between 43-55 U.S. cents per pound, according to type and grade.

At least one large canning company sells a "salmon-type" pack in Mexico City at about US\$7.20 a case. This pack consists of yellowtail and mackerel-type fish.

Outlook: New fishing legislation has been again presented to the 1955 session, but is not expected to be passed this term.

A number of new fishing boats are now under construction, particularly in the Ciudad Carmen shrimp area, and proposals to establish freezing, refrigeration, and

processing plants in a number of ports are under consideration by the Ministry of Navy and private industry. However, budgetary limitations will probably prevent the Navy from executing any largescale facilities in the near future.

According to a brief item published in a Mexico City financial newspaper in September 1955, US\$17.1 million will be invested in the construction of five packing, reducing, and dehydrating plants at Manzanillo, Colima. A company is reported to have been formed to operate these important new seafood plants. This unconfirmed press item stated that

Commodity	Quai		Value		
Commodity	1954	1 953	1954	1953	
	(1,000	Lbs.)	(Equiv.ir	1 US\$1,000)	
Live fish & shellfish	33	4	6.1	2.8	
Unprocessed fish &					
shellfish	148	152	33.0	44.5	
Processed:	1				
Caviar	4	4	6.6	11.5	
Salmon, canned	29	46	10.7	20.9	
Cod. dried	670	1,175	237,3	466,9	
Fish, salted or	i	· ·	j		
smoked	1.508	1.563	404.6	475.9	
Shellfish, dried.					
salted or canned	203	173	80.1	88.1	
Total Imports	2,595	3,117	778.3	1,110.6	
Imports from U. S	152	205	46,0	63.7	

the large investment would be financed jointly by public and private capital. But whether this particular project will be realized as stated or not, it is evident that both private investors and government officials believe there are attractive investment opportunities in the processing of seafood in this country.

Note 1: Quantities and values shown are probably minimums because catch and production data are based on declarations for tax purposes.

Note 2: Values were converted to U. S. dollar equivalents as follows: 1954--12,49 pesos equal US\$1; 1953--8,60 pesos equal US\$1.



Netherlands

WHALING PRODUCTION, 1954/55: Production by the only Netherlands firm operating in the Antarctic whaling industry amounted to 10,948 metric tons of oil and other products during the 1954/55 season. The production consisted of 9,827 metric tons of whale oil, valued at US\$234 a ton, and 1,086 metric tons of sperm oil, valued at US\$200 a ton. Miscellaneous products totaled 35 metric tons.

Despite better prices received for the oils during 1954/55 as compared to 1953/54, the total value received amounted to only US\$2.6 million in 1954/55 as compared



with US\$3.5 million the previous season. The sharp drop of US\$0.9 million was the result of a poor catch due to bad weather conditions. The nominal profit, therefore, totaled only US\$257,249. In order to cover depreciation and maintenance expenses, as well as Government-guaranteed dividends, payments, and reserves, the Netherlands Government paid to the company a subsidy of US\$1.6 million.

During the 1955/56 Antarctic whaling season, the Netherlands is participating with its new factoryship for the first time. This factoryship, the Willem Barendsz, is the largest ship of the Netherlands merchant marine. It will be accompanied by 18 catchers, as compared with the 12 catchers that took part in the 1954/55 expedition. The total production of oil from the 1954/55 expedition was approximately 12,070 short tons.

To date, 16,535 tons of the 1955/56 production of whale oil has been contracted for in advance; 11,023 tons at US\$217 per short ton and the remaining 5,512 tons at US\$216 per ton. In addition, 2,756 tons of sperm oil have been contracted for at US\$178 per short ton.

The 1954/55 season's first-quality whale oil sold for US\$213 per short ton; the average price for sperm oil was US\$182 per ton.

The catch of the old Willem Barendsz in 1954/55 amounted to 116 blue whales, 601 fin whales, and 3 Greenland whales -- a total of 720 whalebone whales plus 128 sperm whales.

Both the numbers of whales and blue-whale units $\frac{1}{2}$ caught during the 1954/55 season were considerably below those of the previous year. The number of whale units caught was 417, compared with 852.1 in the 1953/54 season. A total number of 413.5 units were processed, compared with 836.7 in the previous season. However, because the extraction was relatively favorable this year, whale-oil production was larger than might have been expected by comparing the whale units processed during the two successive seasons. 1/ One blue-whale unit is 1 blue whale; 2 fin whales; $2\frac{1}{2}$ humpback whales; or 6 Greenland whales.



FISHERY TRENDS, DECEMBER 1955: Herring: Price negotiations between fishermen and the Fisheries Ministry of Norway for the 1956 herring season have been completed. The guaranteed average landed price for large herring was fixed at about 1.43 U. S. cents per pound and for spring herring at 1.23 U. S. cents per pound, about \$0.2 U. S. cents over 1955.

Cod: Negotiations on minimum cod prices for the 1955/56 season were still under way, according to a dispatch from the United States Embassy at Oslo. It is believed in fishing circles that the price for Lofoten cod will be set at about 5.1 U. S. cents per pound for fish over 16.5 inches long, approximately 1.8 U. S. cents over 1954. Minimum prices for smaller and less valuable grades of cod are expected to be less than the 1954/55 prices in order to compensate for the increase in the price of large cod.

1955 Mackerel Season: It was announced at a meeting of the Norwegian Mackerel Association in December that 10,800 metric tons of mackerel were caught during the 1955 season, an increase of 400 tons over 1954. This is still well below the normal year's catch, estimated by the trade at between 13,000-14,000 tons.

Canned Brisling in 1955: Due to the poor brisling (sardine) catch in the 1955 season, only 247,000 cases had been packed through November 19, 1955, compared



Hauling in the seine -- Lofoten cod fishery.

with 419,700 cases during the same period of 1954. The season was about over on that date and it has been characterized by the industry as the worst in decades. The canning industry also suffered from less than normal packs of sild sardines and mackerel.

Dried Fish Exports: During 1955, the Conservative press criticized the Government's minimum export pricing system for fish, using the partial loss of the Italian market to Iceland as an example. Although Icelandic sales of dried fish have risen sharply this year, the Norwegians still sell about twice

as much in Italy as the Icelanders. The decline in Norwegian sales to Italy has been relatively small-from 2,067 metric tons in the first seven months of 1954 to 1,853 tons during the same period in 1955. Norwegian exporters point out that their product is still largely competitive due to its high quality.

Guaranteed Wage for Fishermen: The Norwegian Storting has passed a measure to guarantee a weekly wage of about US\$10.50 to herring and cod fishermen. Only fishermen on boats at least 25 feet long with crews of two or more are eligible. A fund of US\$840,000 has been established, to be administered by the Norwegian Fishermen's Association. The export levy on all fish and fish products will be raised 50 percent to cover the costs of establishing the fund. The 1953 and 1954 cod catches were the smallest in years. Wages, based on the individual fisherman's shares and equipment, were very low and the Government was forced to extend US\$420,000 in emergency relief in the Lofoten area in 1954. In 1953, a similar fund was set up, but with a much narrower scope; it applied only to the relatively small number of fishermen on large vessels on trips of at least four weeks' duration. This new fund should go far in alleviating the economic hardship to the fishermen in a poor season.

Loans for Nylon Nets: The Storting in December 1955 appropriated US\$700,000 for loans to fishermen to buy nylon nets. The loan will be made through the State Fisheries Bank at $3\frac{3}{4}$ percent interest to full-time cod fishermen. The size of the loan may be set by the Bank, and it can cover 75 percent of the cost of the nets, up to US\$14 per net. Nylon nets yield catches up to four times the size of other nets currently in use, but they are far more expensive. The problem of financing by the individual fisherman has been the main stumbling block up to now. The Government considered that loans to individual fishermen was preferable to a subsidy on nylon nets, both for financial reasons and because of its policy to keep the small fisherman competitive with larger enterprises.

* * * * *

NEW WHALE CATCHER LARGEST EVER BUILT: The Nortreff, just completed at Fredrikstad, Norway, for Norwegian owners, is described as the world's largest

whale catcher. The vessel is 215 feet in over-all length, 33 feet in breadth, and 18 feet 6 inches in depth, reports <u>The Fishing News</u> (November 25, 1955), a British fishery periodical. The gross tonnage of the vessel is 901 tons. The hull and main deckhouse are of steel, but all other superstructure is of aluminum. Total cost of the vessel was about U\$\$784,000.

* * * * *

HERRING CATCH LOWER IN 1955: The results of the Norwegian 1955 herring season were announced at the Norwegian Herring Marketing Cooperative meeting in Bergen early in November 1955. The 1955 catch was 2,153 million pounds, valued at US\$29.1 million, compared to the previous year's 2,399 million pounds, valued at US\$29.4 million. In 1955, 1,646 million pounds of large herring and 472 million pounds of spring herring were taken, while the balance consisted of other types of herring, a November 10 United States Embassy dispatch from Oslo points out.

The herring oil and meal industry in 1955 received 1,579 million pounds of herring, corresponding to about 150,000 metric tons of meal and 63,000 tons of oil. Production of these byproducts in 1954 was 170,000 tons and 78,000 tons, respectively. All the 1955 production of herring oil has been sold, mostly to the Norwegian fat supply and canning industry.

Exports of herring for 1955 have been satisfactory in both volume and price terms. The export of iced fresh winter herring increased from 476,000 barrels in 1954 to 688,500 barrels in 1955. The export of frozen herring was the highest on record, with 598,000 cases of large herring and 287,000 cases of spring herring delivered to 17 countries.

* * * * *

FISHERY BYPRODUCTS PLANTS INSTALL EQUIPMENT TO RECOVER STICK—WATER: Stickwater units, utilizing the waste water from fish and whale reduction, have so far been installed in 40 plants in Norway and abroad, reports the Norwegian Information Service (December 15, 1955). The machinery is supplied by a Norwegian engineering firm at Haugesund, Norway. A unit model of the machinery is on display at the Norwegian Chamber of Commerce, New York, N. Y.

These units have been installed aboard all floating whale factoryships at most whaling shore stations, including some in Australia, Peru, and South Africa, reports the firm, which claims that its machinery which recovers the stickwater of fish and whale reduction can boost the yield of fish and whale meal by some 20 percent.



Peru

NEW WHALING COMPANY FORMED: A new whaling company has been formed in Peru by a combine of French, Norwegian, Panamanian, and Peruvian interests. The new firm will use the Janine (formerly the <u>Anglo Norsk</u>) as the central unit of the fleet.

The company has obtained a permit from the tripartite Commission (Chile, Peru, and Ecuador) to catch whales in the 200-mile zone along the coasts of the three countries. This permit was granted at the meeting of the Commission in Quito, Ecuador, in December 1955. At the meeting it was also decided that the total annual quota for deep-sea whaling in the 200-mile zone will be 2,100 sperm whales. It is believed that it is highly improbable that any licenses will be granted

to nonnationals. At the present time there is no limit placed on the catch of whales from land stations, states a December 28 report from the United States Embassy at Lima.

* * * *

DEFENSE OF TERRITORIAL-WATERS CLAIM: La Nacion (Government newspaper) in an editorial on December 12, 1955, on the subject of 200-mile jurisdiction refers to the action of the Organization of American States in calling a special meeting on questions of the continental platform to be held in the Dominican Republic in March of 1956. This convention is described as being one to study and solve economic, jurisdictional and scientific problems related to maritime jurisdiction and defense of the natural resources of the maritime zone.

The editorial refers to the Tripartite Declaration of Santiago of 1952 and its ratification in Lima during the past year by the member countries of the Permanent Commission of the South Pacific at its second meeting. The statement is added that "today the third such meeting is taking place in Quito" in order to perfect the regulations signed and ratified by the three countries. In this connection the editorial adds that the thesis of the countries of the South Pacific, originally Peruvian, has been accepted in principle by Colombia, Mexico, Costa Rica, El Salvador, and Uruguay, all of which have sent observers to the meeting which begins today in Quito.

The editorial also refers to Peru's action in punishing an international pirate firm, thus protecting Peru's ichthyological resources. Reference is made to the meeting of the International Whaling Convention which subsequently accepted the Norwegian protest against violation of the convention by Onassis, thus confirming the Peruvian thesis.

The editorial continues that at the International Convention at Trujillo there will be a new discussion of the economic aspects of the doctrine of the continental shelf as it has been affected by the technical developments of submarine petroleum deposits. The statement is made that it was the United States which first formulated the doctrine of the continental platform in 1947. Since that date the capacity for exploitation of petroleum resources under the sea has increased and this activity can now be carried on in greater depths and at greater distances from the coast. Thus, the editorial claims, economic aspects support the thesis of the 200 miles as well as the necessity of conserving fish resources. Furthermore the concepts of national defense have changed, making antiquated the former concepts of marine jurisdiction. All of these facts make it necessary to change the concept of marine jurisdiction. The editorial concludes by saying that the most important point is that any change in principles should benefit equally and fairly all the countries of the continent, and therefore one may be confident of the unanimous acceptance of the Peruvian thesis in the coming Inter-American conference regarding the continental platform.

Portugal

FISHERIES TRENDS, AUGUST 1955: Sardine Fishing: During August 1955 the sardine fishing was good both in terms of tonnage and value, states the November 1955 Conservas de Peixe, a Portuguese trade periodical. Fishermen landed 13,593 metric tons of sardines (ex-vessel value US\$1,665,000) as compared with landings of 12,834 tons (value US\$995,000) in August 1954. The canners purchased 8,356 tons of the total at a cost of US\$1,102,000. The balance of 5,236 tons was used for

local consumption. The port of Matosinhos with 58.6 percent of the total landings led all others in the landings of sardines in August, followed by Portimao with 13.5 percent. Prices paid to the fishermen in August for sardines were about 5.5 U.S. cents per pound as compared with about 3.5 U.S. cents in August 1954.

Other Fishing: January-August landings of other fish were: tuna 1,332 tons (ex-vessel value US\$379,200), bonito 13.4 tons (value US\$17,217), mackerel 4,075 tons (value US\$501,183), anchovies 3,528 tons (value US\$690,817), and chinchard 20,574 tons (value US\$1,262,957).

* * * * *

FISHERIES TRENDS FOR 1955-CORRECTION: In the October 1955 issue of Commercial Fisheries Review, page 100, the last paragraph of the item titled "FISH-ERIES TRENDS FOR 1955" was incomplete. It should have read as follows:

Modernization of the cod fleet and the addition of new and larger units contributed to the larger catch in 1954 and 1955. The Portuguese cod fleet in 1937 comprised 51 small sailing ships, totaling 17,300 gross tons. The fleet now aggregates approximately 70,000 gross tons, with a total complement of 5,000, which is more than triple the 1937 total. Despite the increase in Portuguese cod consumption since 1937, when population increased by more than a million, imports of cod (34,945 metric tons in 1937) decreased in 1954 to 13,548 metric tons, valued at 105 million escudos (US\$3,700,000).

* * * * *

<u>CANNED FISH PACK</u>, <u>JANUARY-JUNE</u> 1955: The supply of fish available to the Portuguese canners during June 1955 was good and the pack included 1,831 metric tons (94,400 cases) of sardines in oil or sauce. The total pack of all canned fish from Jan.-June 1955 was 9,897 tons of which 5,779 tons were sardines in oil or sauce, according to the November 1955 <u>Conservas</u> de <u>Peixe</u>.

Product	Net Weight Canners' Value Product		Net Weight	Canners Value	
	Metric	1,000		Metric	1,000
	Tons	US\$		Tons	US\$
Sardines in brine	398	60	Tuna in brine	12	6
Sardines in olive oil or sauce .	5,779	3,097	Tuna in olive oil		415
Sardinelike fish in brine		198	Tunalike fish in olive oil	73	45
Sardinelike fish in oil		673	Other species (including		
Anchovies, rolled & fillets	775	819	shellfish)	480	250
Continued in opposite column) Note: Values converted to US\$			Total	9,897	5,563

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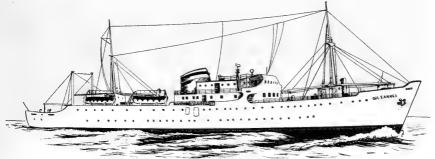
CANNED FISH EXPORTS, JANUARY-AUGUST 1955: Portuguese canned fish exports totaled 5,385 metric tons (283,400 cases), valued at US\$2.7 million, during August 1955; and 37,505 tons, valued at US\$19.1 million, during January-August 1955.

Portuguese Canned Fish Exports, August 1955 and Comparisons										
Species	Aug.	1955	JanAug. 1955		Species	Aug. 1955		JanAug.195		
	Metric	1,000	Metric	1,000		Metric	1,000	Metric	1,000	
	Tons	US\$	Tons	US\$		Tons	US\$	Tons	US\$	
Sardines in olive oil	4,069	1,919	29,855	14,622	Tuna & tunalike in					
Sardinelike fish in					olive oil	209	151	1,431	1,060	
olive oil	480	329	3,149	2,110	Tuna & tunalike in brine	79	46	496	256	
Sardines & sardinelike		ĺ			Mackerel in olive oil	267	152	851	533	
fish in brine	264	59	1,291	247	Other fish	17	11	432	239	
(Total in opposite column)					Total		2,667	37,505	19,067	

Portugal's export of canned fish in August 1955 maintained the high level of previous months, according to Conservas de Peixe, November 1955. During January-August 1955 Germany continued as the leading receiver with US\$3.5 million of canned fish (principally sardines in oil), followed by Italy with US\$3.2 million (principally sardines and tuna), Great Britain with US\$2.5 million, and the United States with US\$2.2 million, principally 1,752 tons of sardines in oil or sauce, 10 tons of tuna and tunalike fish in oil, and 1,118 tons of anchovies.

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SERVICES OF HOSPITAL SHIP OFFERED TO CANADIAN FISHERMEN: For close to five centuries Portuguese fishermen have been reaping rich rewards from the prolific cod banks off Canada's east coast, receiving a warm welcome and using facilities available at Canadian ports. Reciprocating this favorable treatment, the



Gil Eannes, new Portuguese hospital ship for cod fishing fleets in the North Atlantic,

Portuguese are sharing with Canadian deep-sea fishermen the medical and other assistance provided by a deluxe hospital ship which each year spends five months in Newfoundland and Greenland waters with Portugal's cod-fishing fleet.

This assistance will be given by the Gil Eannes, mothership of the Portuguese cod-fishing fleet, which was launched in 1955 and made her maiden voyage to the Northwest Atlantic in May 1955. Advice that such aid would be provided free of charge to Canadian nationals was recently tendered the Canadian Department of External Affairs by the Portuguese Embassy in Ottawa. It will be of particular importance to fishermen operating on the Grand Banks where the Portuguese fleet obtains a large share of its catch.

The Portuguese cod-fishing voyages are conducted by both draggers using otter trawls and the picturesque white-hulled bankers which employ the traditional line gear in trawling from dories. The draggers, numbering about 25, leave for the western waters in February and the dory trawlers, totaling some 45, in April. All told, they carry a complement of approximately 5,000 men.

To assist them throughout the voyage, the Government of Portugal sends a mothership as a guarantee to the fishermen that they will not be abandoned during the voyage. In previous years that assistance was given by warships and later a merchant ship was transformed into a hospital ship and named the $\underline{\text{Gil}}$ $\underline{\text{Eannes}}$. As this ship was growing too old for the purpose a new ship was especially built for this work and also named the $\underline{\text{Gil}}$ $\underline{\text{Eannes}}$.

The hospital ship joins the fishing fleet on the Grand Banks in May and accompanies it in June when most of the vessels sail north for the waters off Greenland.

Many of the vessels, with the \underline{Gil} \underline{Eannes} , subsequently return to the Grand Banks in September for further fishing, and leave for their home ports during the early part of October.

Hospital facilities on the Gil Eannes include two well-equipped operating rooms, up-to-date therapeutical appliances, two isolation wards, and a glass-partitioned general ward with beds for 74 patients. In addition to the staff of doctors and male nurses aboard the ship, there are also a number of trained personnel distributed throughout the fleet who are available for service when called upon. The Gil Eannes is also the focal point of the fleet mail service and for the distribution of general supplies. The vessel is especially designed for the role of mothership and the sight of her gleaming white hull, sailing among the fishing vessels, strikes a note of confidence in the men.

During the fishing season all of the ships visit St. John's at least once, some on several occasions, to take on bait, fuel, and other supplies, have repairs made and attend to other chores that can be better done ashore than afloat. It is in gratitude for the facilities granted for many years by Newfoundland authorities to the fishing fleet and in appreciation for the friendly reception accorded the visiting fishermen that the Portuguese authorities and the Portuguese Ship Owners' Association have placed the services of the Gil Eannes at the disposal of Canadian fishermen, states the November 1955 issue of Trade News, a publication of Canada's Department of Fisheries.

* * * * *

TAX ON OFFSHORE TUNA CATCH REDUCED: In a move to assist the Portuguese tuna canning industry, the tax on the catch of tuna and tunalike fish by offshore vessels has been reduced by the Government from 7 percent ad valorem to about US\$1.23 a metric ton. This new rate will apply only to the September 1955-April 1956 season, states a November 25, 1955, dispatch from the United States Embassy at Lisbon.

Replacement of the ad valorem rate by the lower rate is designed to enable offshore tuna-fishing vessels to sell the catch profitably in the domestic market for canning or for export as frozen tuna. Heretofore, the relatively high ad valorem rate usually forced operators of seagoing-tuna vessels to sell their catch in foreign markets, chiefly in Italy. Sales of frozen tuna direct to foreign markets by operators of the two seagoing Portuguese fishing vessels which are known to have sold tuna abroad in 1954 totaled 958 metric tons, all of which was sold in Italy. Frozen fish landed in Portugal in 1954 and later exported to foreign countries and to the Portuguese overseas territories in that year totaled 625 metric tons.

The two fishing vessels which will apparently benefit from the new tax reduction are both converted Diesel-engined submarine chasers of 840 gross tons each, operated from the port of Aveiro near Oporto. Both vessels have refrigeration facilities, radio, modern depth-sounding equipment, and gyrocompasses.

The new tax measure includes provisions authorizing the establishment of coldstorage facilities ashore in the Azores Islands for the tuna catch, and regulations covering customs control of the catch.



South-West Africa

<u>PILCHARD-MAASBANKER FISHERY:</u> The South-West Africa annual catch quota of 250,000 short tons for the pilchard-maasbanker fishery is allocated to commercial fishing companies on the basis of their annual intake of raw fish. Four companies have an annual allotment of 45,000 tons each, and these same companies are able to process 30 tons of fish an hour for the production of fish meal. Two other companies have an annual quota of 35,000 tons each and are able to process 20 tons of fish an hour for fish meal.

The 1956 pilchard-maasbanker fishery season in South-West Africa will be changed, reports a November 28, 1955, United States consular dispatch from Cape Town. The season formerly was from February 1 until November 30, provided the quota of 250,000 tons had been caught, and if the quota had not been caught, fishing continued until the quota had been reached. Effective January 1, 1956, fishing in South-West Africa will not begin until March 1 and will continue until November 30 or until such time as the fishing quota is attained.



Thailand

SHRIMP FISHERIES: The Thai shrimp fishery at present is confined to shore and estuaries of the Gulf of Siam and to Lagoons bordering the Gulf. One recently-started Japanese-type bull-trawl operation catches shrimp in offshore areas of the Gulf; this operation being incidental to other fishing.

While shrimp fishing is scattered extensively throughout the coast, principal fishing areas at present are: (a) off the mouth of the Menam Chao Phya; and (b) at Songkhla within the Inland Sea (Thale Luang) and its outlet to the Gulf.

The Chao Phya fishery is conducted during the dry season--February to June or July by approximately 100 small boats of no regular type (sampans and other small craft many of which are powered by semi-Diesel or Diesel engines). Each of these boats employ one or two small locally-made beam trawls, reports the United States Embassy at Bangkok in a December 7 dispatch.

The Songkhla fishing is carried on throughout the year by cast nets, beach seining, and traps. No trawls are used.

There are no canneries engaged in packing shrimp, but shrimp drying and shrimp-paste manufacture is important and very widespread. Although freezer space is available, no shrimp are frozen and there is no commerce in this product. Shrimp-flavored chips (<u>Krupoek</u>) are manufactured in considerable quantity for local use.

There are no reliable data on which to base production figures, but it is believed that the total catch (all types of shrimp for all purposes) is at least 44 million pounds annually with production definitely increasing.

Many species make up the commercial catches. For shrimp paste, very small types (<u>Acetes</u> sp.) almost planktonic in size are used. The largest shrimp, a <u>Peneid</u> type, runs 4 or 5 per pound heads on. In between are other species of varying sizes.

No offical figures are available concerning export movements of shrimp or shrimp products. Fresh or iced shipments are very small and are made only occasionally to Malaya from areas near that territory. No frozen shrimp and no canned shrimpis produced or exported. Exports of dried shrimp are made to neighboring countries and to Hong Kong. The quantity of such exports being estimated at 1.1 million pounds a year. There are probably small exports of shrimp paste (Kapi) to countries bordering on Thailand.



Union of South Africa

FISHERY TRENDS, OCTOBER-NOVEMBER 1955: Production of fish in South African waters was disappointing in October and November 1955 and the pack of canned fish (which enjoys a firm market overseas) has been low. According to a Cape Town fishery firm, catch of pilchards is still about 13,000 short tons below the annual quota of 250,000 tons for the Union of South Africa.

It is understood that the output of fish meal and fish oil in the Union of South Africa also has been affected by poor fishing. Only a limited amount of fish meal has been sold on overseas markets, and at high prices.

The production of spiny lobster, however, has been considered satisfactory by the local trade, but with a strong overseas demand for canned and frozen packs, stocks of this commodity held by local fishing companies reportedly remain low.



Venezuela

JAPANESE TUNA LONG-LINER STARTS FISHING: The Venezuelan-Japanese company tuna long-liner Bozo Maru operated by the Japanese started fishing on December 14, 1955, according to Nippon Suisan Shimbun, a Japanese trade publication. The United States Embassy at Caracas reported on November 8, 1955, that the Bozo Maru would operate off the Island of La Blanquilla.



Editorial Assistant -- Ruth V. Keefe

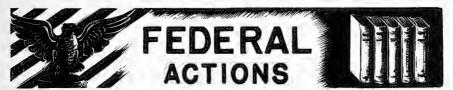
Illustrator -- Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Helen Joswick

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Federal Trade Commission

FROZEN FOOD INDUSTRY TRADE PRACTICE RULES:

Trade practice rules for the frozen food industry were issued January 13, 1956, by the Federal Trade Commission under the trade practice conference procedure. These rules become operative 30 days after date of issue.

The industry for which trade practice rules are hereby established is composed of persons, firms, corporations,



and organizations engaged in the production and/or marketing of vegetables, fruits, juices, fish and shellfish, baked goods, and other miscellaneous prepared foods, which are packed, marketed, and delivered to the ultimate consumer in a frozen state. Not included as products of the industry are meats and poultry, and frozen dairy products including ice cream and sherbets.

With respect to products of the industry as above defined, the rules for this industry supersede those promulgated for the Grocery Industry on March 18, 1952.

The rules are directed to the maintenance of free and fair competition in the industry and to the prevention and elimination of various practices deemed to be violative of laws administered by the Commission. They are to be applied to such end and to the exclusion of any acts or practices which suppress competition or otherwise restrain trade.

Proceedings under which the rules have been established were instituted upon application from members of the industry. A general trade practice conference was held in the offices of the Commission in Washington, D. C., at which proposals for rules were submitted for consideration of the Commission. Thereafter, proposed rules were published by the Commission and made available to all industry members and other interested or affected parties upon public notice whereby they were afforded opportunity to present their views, including such pertinent information, suggestions, or amendments as they desired to offer, and to be heard in the premises. Pursuant to such notice, a public hearing was held in Washington. D. C., on September 8, 1955, and all matters there presented, or otherwise received in the proceeding, were duly considered by the Commission.

Thereafter, and upon full consideration of the entire matter, final action was taken by the Commission whereby it approved and received respectively, the Group I and Group II rules. The Group II rules are not of the type presently the subject of a general study by the Commission.

The rules are divided into two groups. Group I rules embrace unfair methods of competition, unfair or deceptive acts or practices, or other illegal practices, prohibited under laws administered by the Federal Trade Commission; and appropriate proceedings in the public interest will be taken by the Commission to prevent the use, by any person, partnership, corporation, or other organization subject to its jurisdiction, of such unlawful practices in commerce. Specific rules include prohibited discrimination; exclusive deals; prohibited sales below cost; push money; fictitious prices;

false invoicing, billing, etc.; coercing the purchase of one product as a prerequisite to the purchase of other products; misrepresentation in general; defamation of competitors or false disparagement of their products; enticing away employees of competitors; substitution of products; inducing breach of contract; use of lottery schemes, etc.; prohibited forms of trade restraints (unlawful price fixing, etc.); use of the word "free"; misrepresenting products as conforming to standard; procurement of competitors' confidential information; and aiding or abetting use of unfair trade practices.

Group II rules include contractual obligations and proper refrigeration and although their violation does not per se constitute violation of law, correction proceedings in respect thereto may be instituted by the Commission.

Copies of Trade Practice Rules for the Frozen Food Industry are available upon request from the Federal Trade Commission, Washington 25, D. C.



Tariff Commission

INVESTIGATION OF INJURY TO DOMESTIC PRODUCERS BY GROUNDFISH FILLET IMPORTS:

Upon application made January 12, 1956, by the Massachusetts Fisheries Association, Inc., and others, the United States Tariff Commission, on January 16, 1956, under the authority of section 7 of the Trade Agreements Extension Act of 1951, as amended, and section 332 of the Tariff Act of 1930, instituted an investigation to determine whether the products described below are, as a result, in whole or in part, of the duty or other customs treatment reflecting concessions granted on such products under the General Agreement on Tariffs and Trade, being imported into the United States in such increased quantities, either actual or relative, as to cause or threaten serious injury to the domestic industry producing like or directly-competitive products.

Tariff Act of 1930 Par. 717(b) Description of Product
Cod, haddock, hake, pollock, cusk, and
rosefish, fresh or frozen (whether or
not packed in ice), all the foregoing,
filleted, skinned, boned, sliced, or



divided into portions.

Eighty-Fourth Congress (Second Session)

Listed below are public bills and resolutions that directly or indirectly affect

the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber ac-



tions on the bills shown are published; and if passed, they are shown when signed by the President.

OPENING OF SECOND SESSION: The Second Session of the 84th Congress commenced on January 3, 1956.

COMMERCIAL FISHERIES NATIONAL POLICY: H. R. 8001 (Wilson of California) introduced in House January 3. A bill to establish a national policy with respect to commercial fisheries; to establish the office of Assistant Secretary of Commerce for Commercial Fisheries, and define his functions, powers, and responsibilities; to strengthen the commercial fisheries segment of the national economy; and for other purposes; to the Committee on Merchant Marine and Fisheries.

This bill provides for an additional Assistant Secretary of Commerce to exercise all functions with respect to commercial fisheries prescribed by this bill or transferred to him, under the general supervision and control of the Secretary of Commerce,

"...SEC.3. (a) Those portions of the Fish and Wildlife Service of the Department of the Interior having to do with biological, oceanographic, meteorological, technological, economic and other scientific investigations, conservation management, foreign activities, and economic activities, as all of these portions relate to the commercial fisheries, and their functions, are hereby transferred to the Assistant Secretary.

"(b) All records, property, personnel, commitments, and unexpended balances (available or to be made available) of appropriations, allocations, and other funds as the Director of the Bureau of the Budget shall determine to relate primarily to the functions transferred by subsection (a) shall be transferred to the Assistant Secretary.

- "SEC. 4. With a view to keeping the commercial fisheries industry and the Government informed, the Assistant Secretary shall conduct continuing studies, and periodically report on, the following:
- "(1) Production and flow to market of domestically produced fishery commodities;
- "(2) Production and flow to market of foreign produced fishery commodities, as they affect the domestic commercial fisheries:
 - "(3) Trends in production of fishery commodities;
- "(4) Measures appropriate to maximize the sustainable production of fishery commodities and minimize wide fluctuations therein; and
- "(5) The competitive economic position of the several fishery commodities with respect to each other, to competitive foreign-produced fishery commodities, and to other competitive commodities.
- "SEC, 5, (a) The Secretary shall establish, operate, and maintain a program of loans for construction or reconstruction of fishing vessels, and for operating capital and facilities loans needed by fishermen's associations or cooperatives. He shall also establish, operate, and maintain a program of commodity loans to fishermen's associations or cooperatives, and emergency loans, purchases, and payments with a view to securing to domestic fisheries a fair share of the national income. . . .
- "SEC. 6. The Assistant Secretary shall conduct continuing studies, and periodically report, with respect to the following matters:
- "(1) Through biological, oceanographic, meteorological, and other scientific research, he shall study and predict the availability of the living resources which support the domestic fishery industry;
- "(2) Through market research, he shall study, predict, and report on marketing conditions insofar as they affect the domestic fishery industry; and
- "(3) Through such means as he determines to be feasible he shall study, and report on the prospective availability to the market of products produced by the domestic fishery industry.
- "Whenever the Assistant Secretary determines that there is a prospective or actual oversupply of any product or products produced by the domestic fishery industry, he shall engage in promotional and informational activities with a view to stimulating the consumption of such products,
- "SEC. 7. (a) Whenever the Assistant Secretary has reason to believe that any product or products are being or are practically certain to be imported into the United States under such conditions and in such quantities as to render or tend to render ineffective, or materially interfere with, his operations under section 5, or to reduce substantially the amount of any product processed in the United States from any product produced by domestic commercial fisheries, he shall so advise the President. If the President agrees that there is reason for such belief, he shall cause an immediate investigation to be made by the United States Tariff Commission which shall give precedence to investigations to determine such facts. Such investigations shall be made after

- due notice and opportunity for hearing to interested parties, and shall be subject to such regulations as the President shall specify,
- "(b) If, on the basis of such investigation and report to him findings and recommendations made in connection therewith, the President finds the existence of such facts, he shall by proclamation impose such fees not in excess of 50 per centum ad valorem or such quantitative limitations on any article or articles which may be entered or withdrawn from warehouse, for consumption as he finds and declares shown by such investigation to be necessary in order that the entry of such article or articles will not render or tend to render ineffective, or materially interfere with, any program or operation referred to in section 5, or reduce substantially the amount of any product processed in the United States from any product produced by domestic commercial fisheries. In designating any article or articles, the President may describe them by physical qualities, value, use, or upon such other bases as he shall determine.
- "(c) After investigation, report, finding, and declaration in the manner provided in the case of a proclamation issued pursuant to subsection (b) of this section, any proclamation or provision of such proclamation may be suspended or terminated by the President whenever he finds and proclaims that the circumstances requiring the proclamation or provision thereof no longer exist or may be modified by the President whenever he finds and proclaims that changed circumstances require such modification to carry out the purposes of this section.
- $^{44}(d)$ Any decision of the President as to facts under this section shall be final,
- "(e) No trade agreement or other international agreement heretofore or hereafter entered into by the United States shall be applied in a manner inconsistent with the requirements of this section,
- "SEC. 8. (a) The Assistant Secretary shall periodically prepare and disseminate to the public information relating to market conditions, production, and economics of fisheries in the principal fishing countries.
- "(b) The Assistant Secretary shall cooperate with the Secretary of State in providing representation of the United States on International Fisheries Commissions and at International Fisheries Conferences,
- "(c) The Assistant Secretary shall advise and consult with the Secretary of State and with other officers of the United States having responsibilities in the fields of providing economic and technical aid to foreign nations, with a view to providing coordination in programs of such aid insofar as such programs affect the interests of domestic commercial fisheries, The Assistant Secretary shall be represented in all international negotiations conducted by the United States pursuant to section 350 of the Tariff Act of 1930, insofar as such negotiations directly affect domestic commercial fisheries,"

Also: introduced January 9; H. R. 8249 (Curtis of Mass.), H. R. 8285 (Teague of Calif.), and H. R. 8288 (Utr); January 12; H. R. 8360 (Hosmer), H. R. 8363 (Johnson of Calif.), H. R. 8368 (Kilgore), H. R. 8375 (Lipscomb), H. R. 8378 (Monough), and H. R. 8386 (Phillips), January 16; H. R. 8485 (Bell), H. R. 8466 (Hale), H. R. 8478 (Lane), H. R. 8498 (Thompson of Texas), H. R. 8503 (Younger); January 17; H. R. 8366 (Farrington); introduced January 18; H. R. 8589

(Doyle) and H. R. 8590 (Fogarty); January 19: H. R. 8624 (Dorn); January 23: H. R. 8706 (Roosevelt)—all introduced in the House on the dates indicated, all similar to H. R. 8001 (Wilson of Calif.), and all referred to the Committee on Merchant Marine and Fisheries,

FAIR LABOR STANDARDS ACT AMENDMENT: H. R. 8553 (Roosevelt) introduced in House January 17. A bill to amend the Fair Labor Standards Act of 1938, as amend-dq to provide greater coverage for employees of food industries whose activities affect interstate commerce, and for other purposes; to the Committee on Education and Labor.

FOOD ADDITIVES: H. R. 8271 (O'Hara of Minn.) introduced in the House January 9. A bill to amend the Federal Food, Drug, and Cosmetic Act for the protection of the public health, by prohibiting new food additives which have not been adequately pretested to establish their safe use under the conditions of their intended use; to the Committee on Interstate and Foreign Commerce,

Also: \underline{H} , \underline{R} , $\underline{8275}$ (Priest) introduced in the House on the same date and similar to \underline{H} , \underline{R} , $\underline{8271}$,

IMPORT QUOTAS: H. R. 7929 (Lanham of Georgia) introduced in House January 3. A bill to regulate the foreign commerce of the United States by establishing import quotas under specified conditions, and for other purposes; to the Committee on Ways and Means,

Also: introduced January 5: \underline{H} , \underline{R} , 8099 (Bailey) and \underline{H} , \underline{R} , 8131 (Hays); January 12: \underline{H} , \underline{R} , 8326 (Byrd) and \underline{H} , \underline{R} , 8383 (Nelson)—all introduced in the House on the dates indicated and referred to the Committee on Ways and Means, and all similar to \underline{H} , \underline{R} , 7929 (Lanham of Georgia).

TARIFF COMMISSION INVESTIGATION OF FROZEN ALBACORE TUNA IMPORTS; S. Res. 186 (Kuchel and Magnuson) introduced in the Senate January 17. Resolved, that the United States Tariff Commission make an investigation, as provided for in section 7 (b) of the Trade Agreements Extension Act of 1951, to determine whether, as a result of the concession made to Japan, in a trade agreement entered into on June 7, 1955, binding the duty-free treatment of fresh and frozen albacore tuna, this product is being imported in the United States in such increased quantities, either actual or relative, as to cause or threaten serious injury to the domestic industry producing like or directly competitive products; to the Committee on Finance,

Also: introduced in the House January 18: H. Res. 377 (King of Calif.) and H. Res. 378 (Farrington): referred to the Committee on Ways and Means—all similar to S. Res. 186 (Kuchel and Magnuson).

WATER POLLUTION: H. R.8108 (Broyhill) introduced in the House January 5. A bill to provide for the development of a comprehensive master plan to abate and prevent water pollution in the District of Columbia and areas immediately adjacent thereto, and for other purposes; to the Committee on Public Works.



CANNED FISH FOR LENT

There will be plenty of canned fish and shellfish during Lent, the U. S. Fish and Wildlife Service assured housewives on February 1.

Supplies of canned fish and shellfish are well distributed throughout the country and include tuna, salmon, sardines, shrimp, crab, and oysters.

Canned tuna is on the United States Department of Agriculture Plentiful Foods List for February and March. It is relatively low in cost, and is available in a wide variety of styles of pack.

For a cold-weather casserole that the whole family will love, the home economists of the Fish and Wildlife Service suggest this recipe.

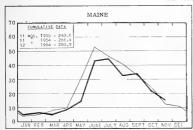
TUNA CASSEROLE WITH TOASTED ALMOND SAUCE

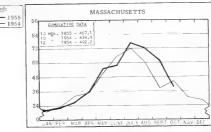
Drain and flake tuna. Cook asparagus as directed on package, Arrange in the bottom of a well-greased baking pan, $11 \times 7 \times 1\frac{1}{2}$ inches, Place tuna in a layer over asparagus. Fry almonds in butter until lightly brown. Blend in flour and seasonings. Add milk gradually and cook until thick, stirring constantly. Add sherry. Pour over tuna and asparagus. Sprinkle with paprika. Bake in a moderate oven, 350° F., for 25 to 30 minutes, Serves 6.

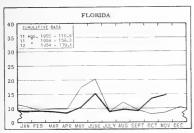


CHART I - FISHERY LANDINGS for SELECTED STATES

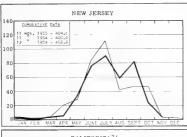
In Millions of Pounds











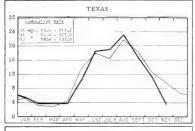




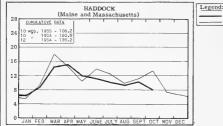


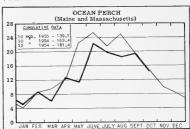
CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

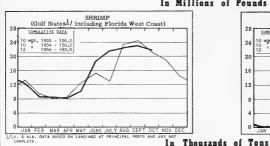
1955

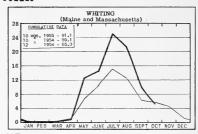
-1954

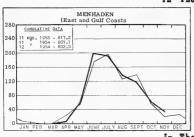


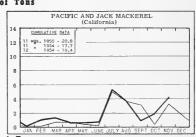


In Millions of Pounds

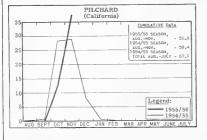








In Thousands of Tons



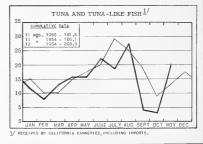
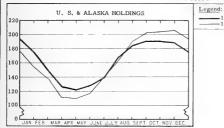
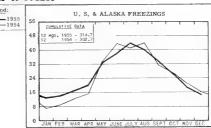
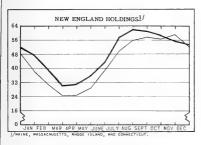


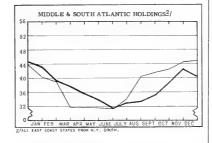
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

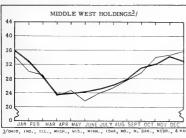


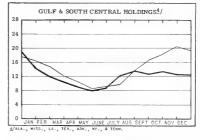


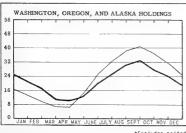














*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

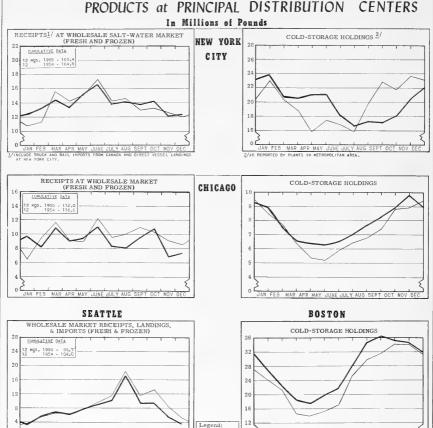
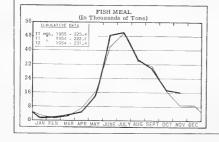


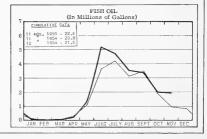
CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

1955 0

-1954



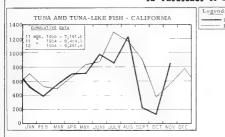
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

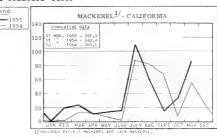


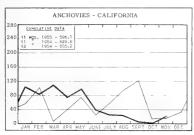
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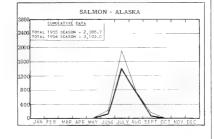
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

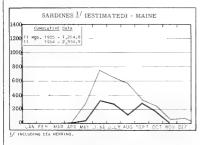
In Thousands of Standard Cases



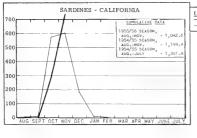








STANDARD CASES								
Variety	No. Cans	Can Designation	Net 3	Vgt				
SARDINES	100	1 drawn	31/4	02				
SHRIMP	48		5	oz				
TUNA	48	No. ½ tuna	6 & 7	oz				
PILCHARDS	48	No. 1 oval	15	oz				
SALMON	48	1-pound tall	16	02				
ANCHOVIES	48	½ lb.	8	oz				



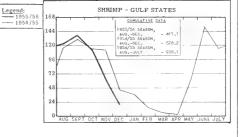
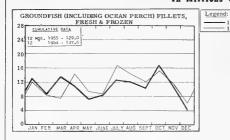
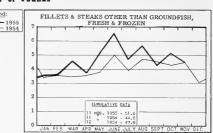
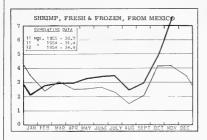


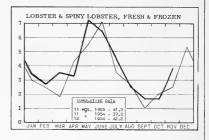
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds

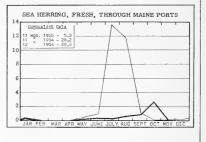


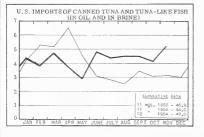




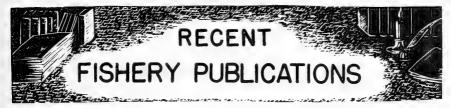












FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA,

EL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCTOR OF FISHERY PRODUCTS AND BYPRODUCTS,

BOUL - DUCTOR OF FISHERY FRODUCTS AND BYPRODUCTS,

SSR. - FISH SPECIAL STATE
SPECIAL SPECIAL STATE
SPECIAL SPECIAL SPECIAL STATE
SEP. - SEPARATES | GRERRINTS | FROM COMMERCIAL FISHERIES
REVIEW | REPUBLISHED | FROM COMMERCIAL FISHERIES
REVIEW | REVIEW | REPUBLISHED | REVIEW | RE

REVIEW.

Number Title CFS-1186 - California Landings - May 1955, 4 pp. CFS-1215 - New York Landings - August 1955, 4 pp. CFS-1216 - Frozen Fish Report - September 1955.

8 pp. CFS-1218 - Fisheries of the United States and Alas-

ka, 12 pp. CFS-1221 - Rhode Island Landings - August 1955,

3 pp CFS-1223 - Fish Stick Report - July-Sept., 2 pp. CFS-1224 - Florida Landings - August 1955, 6 pp.

CFS-1227 - Alabama Landings - August 1955, 2 pp. CFS-1231 - Mississippi Landings - August 1955,

2 pp. CFS-1232 - Fish Meal and Oil - September 1955, 2 pp.

CFS-1234 - Manufactured Fishery Products - 1953, 7 pp

CFS-1226 - New York Landings - September 1955, 5 pp.

Wholesale Dealers in Fishery Products (Revised): SL - 21 - California-1955, 11 pp.

SL - 27 - Indiana-1955, 1 p

SL - 30 - Pennsylvania-1955 (Lake Erie) 1 p. SL - 162 - List of Firms Producing Fish Sticks-1954, 2 pp.

SL - 31 - New York-1955 (Lakes Area), 1 p.

Market Development Lists (Revised):
MDL- 5 - Georgia Locker Plants, 3 pp.

MDL-33 - Arizona Locker Plants, 2 pp. MDL-36 - Arkansas Locker Plants, 3 pp.

MDL-37 - Connecticut Locker Plants, 2 pp.

MDL-38 - Delaware Locker Plants, 1 p. MDL-39 - Florida Locker Plants, 2 pp.

MDL-48 - Alabama Locker Plants, 2 pp.

Sep. No. 422 - Construction Details of Improved Tuna Long-Line Gear Used by Pacific Oceanic Fishery Investigations.

Sep. No. 423 - Research in Service Laboratories (December 1955):

Cold Storage of Frozen Pacific Oysters (Crassostrea Gigas) - No. 1. Oil Research Project at the Seattle Technologi-

cal Laboratory.

Federal Specification for Canned Shrimp.

SSR-Fish. No. 162 - Size Frequencies and Growth of Central and Western Pacific Bigeye Tuna, by Edwin S. Iversen, 146 pp., illus., processed, September 1955.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

Differences in Intensity of Setting of Oysters and Starfish, by V. L. Loosanoff, J. B. Engle, and C. A. Nomejko, 7 pp., illus., printed. (Reprinted from Biological Bulletin, vol. 109, no. 1, pp. 75-81, August 1955.) (Available from U. S. Fish and Wildlife Service, Milford, Conn.)

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1954 (As Reported to Hampton Fishery Market News Office), by Lester A. Keilman, 18 pp., processed, December 1955. (Available free from the Market News Service, U. S. Fish and Wild-life Service, 18 S. King St., Hampton, Va.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers from selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics contained in this annual summary represent the approximate commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual State, or the Chesapeake Bay area as a whole. However, the statistics do give an indication as to the trend in fisheries production for the specific areas designated and do reflect the over-all production trend by species, localities, and by States.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Distribution and Food Habits of the Fur Seals of the North Pacific Ocean (Report of Cooperative Investigations by the Governments of Canada, Japan, and the United States of America, Feb. - July 1952), by F. H. C. Taylor, M. Fujinaga, and Ford Wilke, 86 pp., illus., printed, 50 cents, 1955.

Fish and Shellfish Preferences of Household Consumers, by W. H. Stolting, M. J. Garfield, and D. R. Alexander, Research Report 41, 118 pp.,

illus., printed, 65 cents, 1955. This report is an analysis of a nationwide survey in October 1951 of household consumers' preferences for fresh and frozen fishery products. The survey was conducted under the auspices of the U. S. Fish and Wildlife Service to aid the Nation's fishing industry, which is composed largely of small firms and individuals that find it difficult to make adequate contacts with consumers. Of the 2,473 persons interviewed in the survey, 94.4 percent indicated that their households had used some kind of fishery product in the 12-months period preceding the interview, and only 5.6 percent had used none. Detailed information on the specific likes and dislikes relative to the various fishery products also was obtained.

The Seals, Sea-Lions, and Sea Otter of the Pacific Coast, by Karl W. Kenyon and Victor B. Scheffer, Circular 32, 34 pp., illus., printed, 20 cents, April 1955. Brief identification key (including drawings and photographs) for seals, sea lions, walrus, and sea otter of the Pacific from Mexico to Point Barrow and the Hawaiian Islands.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND VILOLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REAGAINE PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

- "Adson Casey, Commercial Fisherman," article, Michigan Conservation, vol. XXIV, no. 4, July-August 1955, pp. 15-18, illus., printed. Michigan Department of Conservation, Lansing, Mich. Describes and illustrates with a group of pictures the activities of a commercial fisherman in the Great Lakes fisheries.
- La Anchoveta y la Harina de Pescado (The Anchovy and Fish Meal), 57 pp., illus., printed in Spanish. Sociedad Nacional de Pesqueria, Avenida Wilson 911, Lima, Peru, 1954. One section of this report discusses the fish meal industry of Peru.
- Arsmelding 1953 fra Fiskeridirektoratets Kjemisk-Tekniske Forsknings-institutt (Annual Report of the Norwegian Fisheries Research Institute for 1953), by E. Heen, 52 pp., printed in Norwegian. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1955. A summary of the research work carried out at the Norwegian Fisheries Research Laboratory during 1953 covering the following subjects: preservation of herring for reduction purposes by means of NaNO2; packaging materials; fresh and frozen fish; herring products; fish meal; fish oils; and chemical composition of fish and fish products. The report ends with a summary of the work on vitamins and a description of different machines and production methods in the manufacture of meal from herring and other fish.
- Australian Journal of Marine and Freshwater Research, vol. 6, no. 3, October 1955, 174 pp., illus., printed, single copy 7s. 6d. (85 U. S. cents). Australian Journal of Marine and Freshwater Research, Commonwealth Scientific and

Industrial Research Organization, East Melbourne, C. 2, Victoria. Includes, among others, the following article: "Underwater Studies on the Tasmanian Commercial Scallop, Notovola meridionalis (Tate) (Lamellibranchiata: Pectinidae)," by A. M. Olsen.

- Bremerhaven, Der Fuhrende Fischereinhafen (Bremerhaven, the Leading Fish Harbor), 224 pp., illus., printed in German. Internationale Verlags-Gesellschaft, Robert Bargmann (publisher), Bremen, W. Germany, 1953. Deals with the fishing activities at Bremerhaven. Discusses the economic aspects of the fishing industry and fishing enterprise; reconstruction of the Bremerhaven fish harbor; development and duties of the Bremerhaven Port Trust; and Bremerhaven, the most important of German fish harbors; and gives a description and plan of the harbor. Describes the various species of fish landed, and discusses echo sounders, the wholesale handling of coastal fish, marketing, and processing of fish.
- Bulletin of the International Oceanographic Foundation, vol. 1, no. 3, November 1955, 65 pp., illus,, printed. The Marine Laboratory, University of Miami, Coral Gables, Fla. Includes, among others, the following articles: "Radioactivity in Ocean Science," by T. C. Helvey; "Scripps in the Present Tense," by Thomas A. Manar; "Measuring the Ocean," by Lansing Wagner; "Set a Fish to Catch a Fish."
- Les Crustaces Comestibles des Mers Tunisiennes et Leur Peche (The Crustaceans of the Tunisian Waters and Their Fisheries), by Henri Heldt and Jeanne H. Heldt, Annales No. IX, 26 pp., illus., printed in French. Station Oceanographique de Salammbo, Tunis, Tunisia, March 1954. The purpose of this report is to indicate the species of edible crustaceans which are found in Tunisian waters, furnish some basic data on their biology, indicate the type of bottom where they are found, and the types of gear used to catch them.
- Enlatado, Curado y Otros Metodos de Preservacion
 del Pescado y Elaboracion de Sub-productos
 (Canning, Curing and Other Methods of Fish Preservation and Utilization of Byproducts), by A. Lopez Matas, 182 pp., illus., printed in Spanish. Food and Agriculture Organization of the United Nations, Rome, Italy, 1954. Contains the text of lectures on fisheries technology given at the First FAO Latin American Fisheries Training Center in Valparaiso, Chile, in 1952. The booklet is divided into two parts and the following chapters: Part I -- (1) Historical Outline and Basic Principles; (2) Spoilage of Canned Food; (3) Sterilization of Canned Foods; (4) Fish Canneries; (5) Operations Involved in Canning of Fish; (6) Containers and Packages; (7) Fish Canning Machinery; (8) Canning Methods; (9) Canning of Shellfish; (10) Special Canned Products; (11) Products Packed in Hermetically Sealed Containers without Sterilization; (12) Analysis and Inspection of Canned Fisheries Products; (13) Nutritive Value of Canned Fisheries Products; (14) Products from Dried Fish; (15) Dry ing of Fish without Salting; (16) Salting of Fish; (17) Brined and Pickled Fish; (18) Smoking of Fish: (19) Caviar and Other Products from Fish Roe; and (20) Products from Fermented Fish.

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Part II-(1) Production of Fish Meal and Oil; (2) Fish Oils; (3) Fish Liver Oils; (4) Production of Albumen from Fish; (5) Manufacture of Adhesives from Fish; and (6) Products from Seaweeds.

- (FAO) Bacterial Fish Spoilage and its Control, by Ernest Hess, FAO Fisheries Papers No. 4, 11 pp., processed. (Reprinted from Food Technology, vol. IV, no. 12, pp. 477-480, 1950.) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, May 1955.
- (FAO) Economic Influence on Design of Fishing Craft, by C. Beever, FAO Fisheries Papers No. 3, 8 pp., processed. (Reprinted from Fishing Boats of the World, Fishing News, Arthur Heighway Publications Limited, Ludgate House, 110 Fleet St., London E. C. 4) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, April 1955.
- (FAO) Fishing Boat Tank Tests, Part I, compiled by Jan-Olof Traung, 168 pp., illus., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, November 1955. A catalogue of fishing-boat tank-test results intended for naval architects to enable them to predict, with few calculations, the required power for new designs and, at the same time, allow them to study influence of varying proportions, coefficients, etc., upon resistance and power requirements. At the 1953 FAO International Fishing Boat Congress a paper entitled "Outline to a Catalogue of Fishing Boat Tank Tests" was presented in which the results from a number of resistance tests were given. The general opinion of the participants at the Congress was that a continued publication of such fishing-boat tank-test results would be a useful service to naval architects. The "Outline" catalogue contained 46 data sheets. The first part of the present catalogue contains an additional 104 sheets, and it is presented in looseleaf form so that additional sheets may be added at any time. The data sheets cover models with both high and low specific resistance and a wide variety of types.
- (FAO) The Food Technologist and the World Food Crises, by Mogens Jul, FAO Fisherites Papers No. 5, 10 pp., processed. (Reprinted from Food Technology, vol. 3, no. 9, pp. 279-283, 1949.) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, May 1955.
- (FAO) Improving the Fisheries Contribution to to World Food Supplies, FAO Fisheries Papers No. 1, 25 pp., illus., printed. (Reprinted from FAO Fisheries Bulletin, vol. VI, no. 5, Sept. Oct, 1953) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, April 1955.
- (FAO) Index to FAO Fisheries Bulletin Vol. VII, 4 pp., printed. (Reprinted from FAO Fisheries Bulletin, vol. VII, no. 4, October-December

- 1954.) Food and Agriculture Organization of the United Nations, Rome, Italy.
- (FAO) Lists of (A) Manufacturers of Nylon Yarn and Other Artificial Fibers; (B) Manufacturers and/or Suppliers of Nets, Nettings and Twines made of Nylon or Other Synthetic Fibers; and (C) Manufacturers and/or Suppliers of Fishing Lines made of Nylon or Other Synthetic Fiber Materials, FAO/55/11/7294, 14 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, November 1955.
- (FAO) A Note on the Fisheries Resources of the North West Atlantic, by G. L. Kesteven and S. J. Hott, FAO Fisheries Papers No. 7, 12 pp., illus., processed. A paper submitted at the Fifth (1955) Session of the International Commission for the Northwest Atlantic. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 1955.
- (FAO) The Problem of the Introduction of Foreign Species into Inland Waters-Both Natural and Cultivated Species, FAO Fisheries Papers No. 2, 12 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1955. Combines three papers entitled "Some Notes on the Principles of Inland Fisheries Management and Development, with Special Reference to the Problem of Introduction;" "Notes on the Freshwater Fish Fauna of Middle Central America, with Especial Reference to Pond Culture of Tilapia," by George S. Myers; and "Destroying a Myth."
- (FAO) Report to the Government of Pakistan on the Mechanization of West Pakistan Fishing Boats, FAO Report No. 403, 128 pp., illus., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, September 1955. It is generally agreed that West Pakistan fishing boats were well built and manned by enterprising fishermen who go far out to sea and land good catches. However, it was questioned by the Pakistan government whether or not certain European or American fishing boats were more efficient than those used in Pakistan. A survey made by FAO's naval architect in 1951 indicated that the Pakistan boats were of an unusually advanced design, complying with modern laws of naval architecture, and it was felt that the mere introduction of boats from abroad would not necessarily result in a more efficient fleet than could be obtained by mechanizing the local boat types and modifying them slightly, so as to make them more suitable for fishing with modern gear and methods. This report includes general observations on West Pakistan fishing boats and discussions of the mechanization of available boats and construction of new boats. It also includes a reprint of the article entitled "West Pakistan Fishing Craft," by M. Rahimullah Qureshi, Henry Magnusson, and Jan-Olof Traung; and "A Note on Financial Assistance Schemes for the Purchase and Improvement of Fishing Craft," by C. Beever, FAO Fisheries Economist.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

- (FAO) Some Basic Economic Problems of Fishery Development in South and East Asia, FAO Fisheries Papers No. 6, 12 pp., illus., processed. Discusses problems of fishery expansion and fish marketing. Based on papers presented at the FAO Regional Consultation on the Selective Expansion of Agricultural Production and Consumption, Ceylon, June 20-25, 1955. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 1955.
- (FAO) Yearbook of Fishery Statistics, 1952-53 (Annuaire Statistique des Peches, Anuario Estadistico de Pesca), vol. IV, Part 1, 1954 Supplement, 76 pp., processed, in English and French with table of contents and introduction in Spanish. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955. This 1954 Supplement brings up to date Section I (Catch and Landings) of Volume IV, Part I of the Yearbook of Fishery Statistics, except for table 2 and tables 16-19. Since the issue of the Yearbook, 1954 landing statistics have been received from many countries including most of the principal producers (among them, for the first time, the U.S.S.R.), as well as revisions of earlier data, particularly for the year 1953. The supplement contains summaries of catch and landings of fishery products, and quantity and value of landings by countries and by species for 1938, 1947-54.
- (FAO) Yearbook of Fishery Statistics, 1952-53 (Annuaire Statistique des Peches, Anuario Estadistico de Pesca), vol. IV, Part 2 (International Trade; Commerce International; Comercio International), 342 pp., printed in English and French with introduction, table of contents, and general notes in Spanish, US\$3. Food and Agriculture Organization of the United Nations Rome, Italy, 1955. (Also available from Columbia University Press, International Documents Service, New York 27, N. Y.) Part 2 (International Trade) completes the Yearbook of Fishery Statistics, 1952-53. Part I (Production and Craft) appeared earlier in 1955. The time series in Part 2 is confined generally to the 5 postwar years, 1949-53, which, wherever possible, are compared with a single prewar year, usually 1938. For most of the countries, figures for other years may be found in preceding editions of the Yearbook, particularly the third issue (1950-51). Section I contains 3 summaries showing world trade in fishery products by continent and commodity. Twelve summary tables are presented in Section II -- one for each of the commodity groups. These show country totals and continental and world aggregates of quantities and values. The 5 tables appearing in Section III present imports and exports of certain fishery products which, although included in the tables of Section II as components of the respective commodity groups, are shown individually because of their relative international significance. The last 6 Sections, IV-IX (one for each continent), present, for each of the 110 customs territories, listed in the English alphabetical order, a table showing the imports and exports of fishery products. These country tables give the quantities and values

- for the detailed items appearing in the national publications. These items, broken down for the quantities by country of origin and destination are arranged by commodity groups.
- Fish and Wildlife, The Story of the Work of the U.S. Fish and Wildlife Service, C.B. Colby, 48 pp., illus., printed, \$1.25. Coward-Mc Cann, Inc., New York, N. Y., 1955.
- Fishes of the Family Percophididae from the Coasts of Eastern United States and the West Indies, with Descriptions of Four New Species, by Isaac Ginsburg, 17 pp., illus., printed. (Reprinted from Proceedings of the United States National Museum, vol. 104, no. 3347, pp. 623-639.)
 Smithsonian Institution, U. S. National Museum, Washington, D. C., 1955.
- Fishes of the Gilbert Islands, by John E. Randall,
 Atoll Research Bulletin No. 47, 258 pp., illus.,
 processed. The Pacific Science Board, National Academy of Sciences, National Research
 Council, Washington, D. C., August 31, 1955.
- Florida's Commercial Fisheries, by Carter C. Osterbind with the assistance of Elise C. Jones, State Economic Studies No. 7, 175 pp., illus., printed, \$3. Bureau of Economic and Business Research, College of Business Administration, University of Florida, Gainesville, Fla., 1955. A study in four parts of the marketing practices of Florida's commercial fisheries, the location of markets, production and production methods, economic developments, and economic importance. Part I discusses Florida's out-of-state seafood markets, covering the important markets, the scope of the consumer market, consumer preferences and practices influencing seafood markets, and role and influence of buyers in central wholesale markets. Part II discusses commercial fishing operations; practices, production, and costs; and points out the characteristics of the fishing operations and of the individual firms involved in these operations. It also illustrates the extent to which these characteristics are responsible for the problems under discussion and suggests adaptations necessary to meet the need for better marketing practices. Part III discusses the economic developments of the fisheries of Florida, showing (1) the broad outlines of the development from 1880 (the earliest date for which statistics are available) to 1953; (2) certain regional characteristics of the early and more recent developments; and (3) annual characteristics of the landings for the 15-year period from 1939 to 1953. Part IV discusses the economic importance of Florida's fisheries and the outlook for the future. Appendix I summarizes the replies to questions raised in interviews with Atlanta and Birmingham seafood wholesalers and chain-store buyers. Appendix II describes the survey of the Florida fisheries and the sampling procedure. Appendices III and IV give statistical data on the production and value of Florida's fisheries.
- "Fluctuations in Abundance of the Giant Scallop,
 Placopecten magellanicus (Gmelin), in the Digby Area of the Bay of Fundy," by L. M. Dickie,

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article, Journal of the Fisheries Research Board of Canada, vol. XII, no. 6, 1955, pp. 797-857, illus., printed. Fisheries Research Board of Canada, Ottawa, Canada. Fluctuations in total landings and in catch per boat have characterized the Digby scallop fishery since it began in 1920. An analysis of records of the fishery indicates that, although changes in fishing methods have been partly responsible for early changes in catch, their influence in recent years has been small and changes in abundance have been primarily responsible for fluctuations in the fishery since it reached its full development in the mid-thirties. Changes in abundance are assessed from analyses of catch records, special "census fishing" techniques, submarine photography, and marking experiments. Estimates from the different methods correspond. Scallops are recruited into the catchable population as six-year-old year-classes. Abundance is high when these recruited year-classes are strong, but is low when they are weak. Abundance in any year is correlated with water temperature six years previously. Both abundance and the strength of individual year-classes are correlated with water temperatures which prevailed at the time the scallops were present as pelagic larvae. It is concluded that changes in the abundance of the catchable scallop stocks result from the combined action of temperature and circulation on the pelagic larvae. Low temperatures retard larval development, and are indicative of the great exchange of water in the Bay of Fundy with outside water masses. This apparently leads to heavy losses of the larvae from the Bay, poor sets on the parent beds, weak year-classes, and low abundance of the catchable stocks of six years later. High temperatures speed larval development and are indicative of a closed Fundy circulation which holds the larvae in the vicinity of the parent beds. This leads to good sets, strong year-classes, and high abundance of the catchable stocks six years later.

Frogs of Southeastern Brazil, by Doris M. Cochran, Bulletin 206, 423 pp., illus., printed, \$2. Smithsonian Institution, Washington 25, D. C., 1955.

The General Agreement on Tariffs and Trade,
Negotiations Under the Trade Agreement Act
of 1934 as Amended and Extended (Supplemental Notice of U. S. Intention to Negotiate; Supplemental List of Products to be Considered;
Notice of Supplemental Public Hearings by
Committee for Reciprocity Information), Department of State Publication 6183, Commercial Policy Series 153, 19 pp., processed, 15
cents. Department of State, Washington, D. C.,
December 1955. (For sale by the Superintendent of Documents, Government Printing Office,
Washington 25, D. C.)

Highway to the North, by Frank Illingworth, 293 pp., illus., printed, \$7.50. Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y. The author, a Briton, details his experiences in this travelog of his journey (in reality, a report of 2 separate journeys) from his London home to the Arctic wasteland of North America.

Although the book purports to be an account of people and places, the author admits of "inaccuracies which can creep into a book," and they do. From Dawson Creek in British Columbia. Canada, the author's journeys take him 1.500 miles via the Alaska Highway to Whitehorse in Yukon Territory, and to Fairbanks, Alaska. By air, visits are made to other places in Alaska, notably Kotzebue, a picturesque Eskimo village, headquarters for several "white" traders. Like numerous others who have journeyed to Alaska and the Arctic to see and learn for himself, Frank Illingworth tells of numerous old timers and their colorful recollections. Little mention is made of fish or fisheries or the resources of the northern seas. Some mention is made of fishing through the ice for tomcod, a small species of codfish commonly used as food for both the Eskimos and their dogs.

-- N. B. Wigutoff

How to Collect Shells, 75 pp., printed, \$1. American Malacological Union, Marinette, Wis., 1955.

(ICA) Operations Report, November 16, 1955, FY 1955, Issue No. 4, 114 pp., illus., processed. Statistics and Reports Division, Office of Research, Statistics and Reports, International Cooperation Administration, Washington 25, D. C. In addition to the usual tables and data, discusses The Mutual Security Program for Fiscal Year 1956.

Mammals, A Guide to Familiar American Species, by Herbert S. Zim and Donald F. Hoffmeister, (A Golden Nature Guide), 160 pp., illustrated by James Gordon Irving in color, printed, \$1.95. Simon and Schuster, New York, N. Y. Consists principally of illustrations with descriptive text and includes among the many mammals, sea mammals such as porpoises, dolphins, and whales.

Memoirs of the Faculty of Fisheries, Hokkaido
University, vol. 3, no. 1, 93 pp., illus., printed.
Contains this paper: "Studies on the Proteins
of the Meat of Sea Cucumber (Stichopus japonicus Selenka)" by E. Tanikawa. The Faculty
of Fisheries, Hokkaido University, Hakodate,
Japan, 1955.

Mesa Redonda Sobre la Industrializacion de los Recursos Marinos Cubanos (Round Table on the Industrialization of the Marine Resources of Cuba), Mayo 27, 28 y 29, 1955, processed in Spanish. Departamento de Publicidad y Actividades Sociales, Universidad de Oriente, Santiago, Cuba. Includes, among others, the following articles: "Sugerencias para el Mejoramiento de las Artes y los Metodos de Pesca en Cuba," by Jose A. Suarez Caabro; "Los Factores Geograficos en la Produccion Pesquera," by Dr. Gerardo A. Canet; "Peces Comestibles y Comerciables de Cuba," by Luis Howell Rivero; "Biología y Tecnología en la Industria del Ostion," by Isabel Perez Farfante; "Informe Sobre las Investigaciones Realizadas con Algas Marinas Cubanas Industrializables," by Felix Solonis; "Resultados de la Primera Investigacion Sobre Posibilidades Industriales

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con Algas Marinas de las Costas de la Provincia de Oriente," by M. Diaz-Piferrer; "Necesidad de Incluir en los Programas de Estudios de las Escuelas Cubanas los Temarios Sobre Biologia Marina," by Dr. Manuel W. Aguilera Barciela; and "Importaciones Cubanas de Pescado," by Dr. Byron White.

- Peces Comunes de la Costa Peruana (Common Fish of the Peruvian Coast) Serie de Divulgacion Cientifica no. 6, 123 pp., illus., processed in Spanish. Ministerio de Agricultura, Direccion de Pesqueria y Caza, Lima, Peru, 1955. Shows a sketch, the common English and Spanish names, scientific name, and a short description of each species included.
- Philippine Fisheries Yearbook, 1953, 343 pp., illus., printed. Bureau of Fisheries, Manila, Philippines. This is the initial number of the Philippine Fisheries Yearbook. It is intended to help bring about greater expansion and improvement in the fishing industry and thus increase its usefulness by increasing opportunities for employment and making the Philippines -- a fish-consuming country-self-sufficient in fish. The Yearbook contains many interesting articles, some of which are: "The Economic Significance of the Introduction of Tilapia in the Philippines;"
 "Culture Tilapia -- for Food and Profit;" "A New Opportunity for Filipinos: Trawling in Oceanic Waters;" "Conversion of LCM's for Otter Trawl and Basnig Fishing;" "Electronic Fish Finder;" "Handling and Processing of Some Fisheries Products in Southern Philippines;" "Know th "Know the Food Value in Your Favorite Fish;" "Fisheries Statistics of the Philippines, 1952;" "Philippine Commercial Fishing Craft & Gear;" and "Common Philippine Market Fish." A directory of the Philippine fishing industry, containing the names of manufacturers and dealers, etc., is also included.
- Reptiles and Amphibians, A Guide to Familiar American Species, by Herbert S. Zim and Hobart M. Smith. (A Golden Nature Guide), 157 pp. illustrated by James Gordon Irving in color, printed, \$1.50. Simon and Schuster, New York, N. Y. Consists chiefly of illustrations with descriptive text and includes turtles, frogs, alligators, and crocodiles.
- "Småtrålernes lønnsomhet, 1954," by Arthur Holm, article, <u>Fiskets Gang</u>, vol. 41, no. 45, November 10, 1955, pp. 598-603, printed in Norwegian with summary in English. Fiskeridirektoren, Postgiro nr. 661 81, Bergen, Norway. The cost investigations of Norwegian trawlers of less than 300 gross tons are based on samples of accounts collected from the shipowners.
- A Technique for the Spectral Analysis of Sound in the Ocean, by Paul Ferris Smith, Joseph D. Richard, and Frank H. Stephens, Contribution No. 143, 6 pp., illus., printed. (Reprinted from Transactions, American Geophysical Union, vol. 36, no. 3, June 1955, pp. 413-418) Marine Laboratory, University of Miami, Coral Gables, Fla. A method is given for presenting a continuous quantitative spectrum of sound in the ocean. A more detailed spectrum is obtained

- than from previous methods with the advantage of convenient and rapid operation. The technique has proved useful in the analysis of subsurface oceanic sounds, examples of which are given, and will facilitate the analysis of oceanographic noise spectra of meteorological, biological, or volcanic origin. The method is based upon a modification and adaptation of a commercially-available heterodyne type sonic analyzer with cathode ray tube presentation. Provisions for photographic recording have been added.
- The Tohoku Journal of Agricultural Research, vol. 5, no. 4, 111 pp., illus., printed, March 1955. Faculty of Agriculture, Tohoku University, Sendai, Japan. Contains, among others, the following articles: "Studies on the Protein Hydrolysis for the Lysine Estimation in Feed," by F. Kondo and T. Hatano; "Ecology of Oyster Bed. I. On the Decline of Productivity Due to Repeated Cultures," by S. Ito and T. Imai; and "Fatty Acids Composition of Saury Oil by Spectrophotometric Method," by Y. Tsuchiya and M. Kayama.
- (Union of South Africa) Twenty-Fifth Annual Report of the Division of Fisheries, Department of Commerce and Industries (For the Period 1st April, 1953-31st March, 1954), by Dr. J. M. Marchand, 162 pp., printed. (Reprint from Commerce & Industry, July 1955.) The Govment Printer, Pretoria, South Africa, 1955. A review of the deep-sea and inshore fisheries of South Africa, with special reference to trawling; whaling; and the pilchard, rock lobster, and line fisheries. Contains also chapters on research at sea and ashore, fishing harbors, and the pilchard research program.
- Water, The Yearbook of Agriculture 1955, 751 pp., illus., printed, \$2.00. U.S. Department of Agriculture, Washington 25, D. C. (For sale by Superintendent of Documents, Washington 25, D. C.). The purpose of this Yearbook is to supply as much information as possible about water in a practical, useful way for farmers and others who use and are interested in water and its resources. The committee that planned the scope of the book set forth this aim at the start for the guidance of the men who wrote the chapters: "Our primary aim is to explain the nature, behavior, and conservation of water in agriculture...... Although some of the broad problems are forecast, the main emphasis is on the facts and basic principles that will help people in reaching the best decisions regarding water resources. Hydroelectric power, navigation, industrial use, pollution, and other aspects are touched on, but this book is concerned principally with water in agriculture. However, incidentally throughout the book there are references to fish, fisheries, fishing, fertility of fishing waters, and the work of the U.S. Fish and Wildlife Service in relation to water. The principal subjects covered by the book include our need for water, where we get our water, water and our soil, caring for our watersheds, and the relationship between water and our forests, irrigation, our crops, our ranges and pastures, wildlife, farms, and cities. A section of the book is devoted to a look to the future on water problems and their solution.

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SALMONS

There are five North American species of Pacific salmon and one additional Asian species. There is one marine Atlantic salmon and three landlocked species.

Five species of salmon inhabit the waters of the Pacific coast of North America. These are the pink or humpback salmon; the king or chinook salmon; the red, sockeye, or blueback salmon; the silver or coho salmon; and the chum, keta, or dog salmon. These five species belong to the genus Onchorhyncus of the family Salmonidae (salmons and trouts).

These five salmon species occur also in the western Pacific, generally from Kamchatkatothe island of Hokkaido in northern Japan. A sixth species (Onchor-



hyncus masu), called masu in Japan, is found from southern Japan northward to the Island of Sakhalin; the masu is an important commercial fish in Japan but is less valuable than any of the five American species.

Fishery Leaflet 14, "Pacific Salmons," discusses the general life history of the Pacific salmon-eggs, food, migration, and importance; describes each species individually giving the range, fresh-water life, ocean life, age at maturity, length and weight, and time of run; and includes a table showing the commercial catch of salmon in Pacific Coast States and Alaska, 1947-52.

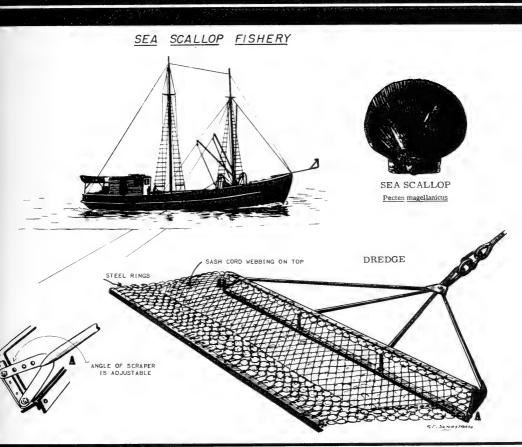
There is only one marine Atlantic salmon, which once was abundant in most larger New England rivers and in many smaller streams. Today there are only remnants of the New England runs, in the Penobscot and Dennys Rivers and a few streams in the eastern part of Maine. In Canada, rivers of the Maritime Provinces still have substantial runs.

Fishery Leaflet 176, "Atlantic Salmon (Salmo salar)" discusses what is known about the Atlantic salmon, including migrations, spawning, eggs, fresh-water life, and the cooperative program of salmon rehabilitation conducted in Maine by the U.S. Fish and Wildlife Service and the Atlantic Sea Run Salmon Commission of the State of Maine.

There are also three landlocked species: the Sebago salmon, <u>Salmo salar sebago</u>, which lives in northern New England; the ouananiche, <u>S. S. ouananiche</u>, which is found in Quebec; and the kokanee, <u>Oncorhynchus nerka kokanee</u>, from the Pacific northwest,

Copies of these fishery leaflets are available free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

COMMERCIAL DEVIEW FISHERIES LEVILW



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FISH and WILDLIFE SERVICE United States Department of the Interior Washington, D.C.



COMMERCIAL FISHERIES REVIEW



Page

A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

 ${\tt J.Pileggi, Associate \, Editor \qquad H.M. \, Bearse, Assistant \, Editor}$

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U.S. Department of the Interior, Washington 25, D.C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/31/57)

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COVER: The Atlantic Coast sea scalloper is one of the more common types of vessel fishing out of the ports of New Bedford and New York, This type of fishing vessel can be easily comverted to dragging for bottom fish or to the harpoon fishery for swordfish. The extension on the bow of the vessel is used while swordfishing. The sea scallop fishery is one of the most valuable on the Atlantic Coast, The annual ex-vessel values of sea-scallop landings is about US\$10.

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FISH AND WILDLIFE SERVICE AIDS FISHING INDUSTRY IN PROMOTING FISHERY PRODUCTS IN COLUMBUS, OHIO

By Robert P. Seifert*

An unusual concentration of fish-cookery demonstrations and institutional-type promotion by the U. S. Fish and Wildlife Service and the fishing industry were conducted in Columbus, Ohio, from September 20 to November 20, 1954. This project represented the first concentrated joint industry-Service effort to make the consumers of a specific area "fish conscious." This experimental program's successand its lessons may well point the way to similar, and even more successful, promotional campaigns in other areas.

The program provided an excellent example of the methods by which the fishing industry and the Fish and Wildlife Service can cooperate in any area, large or small, to increase the consumption of fishery products. The National Fisheries Institute (NFI) concentrated its efforts on fish fillets and fish sticks. Spot radio announcements 5 days per week, Monday through Friday; TV commercials 4 days per week, Tuesday through Friday; and newspaper ads in the evening papers were all placed by the National Fisheries Institute in Columbus through its advertising agency. In addition, the Institute supplied Columbus newspaper food editors with fish recipes and pictures. These, as was true of all NFI advertising, were of the product or industry type, and no brand was named in any of the copy. Sparked by NFI's efforts, the industry (producers as well as local distributors and retailers) spent considerable time and money in "pushing" and advertising their own brands of fishery products, with emphasis on fish fillets and fish sticks to complement the general promotion. Outstanding among these efforts were the full-page newspaper ads on fish sticks run by a major producer.

To this campaign the U. S. Fish and Wildlife Service contributed the services of a home economist and fishery marketing specialists (from its Educational and Market Development Section of the Branch of Commercial Fisheries) who arranged and presented a series of fish-cookery demonstrations in the Columbus area. The demonstrations were given for cooks and managers of parochial and public school cafeterias, Air Force and Naval Station mess halls, public and private institutions, Ohio State University food-service personnel, television food shows, and for a food class at the local electric company. In addition, Fish and Wildlife Service personnel interviewed the food editors of the three Columbus newspapers, and a feature writer and radio food editor of Columbus. It was possible to furnish all of these editors with useful fishery educational material, including fish recipes, pictures, and Service publications. Although the campaign was primarily concerned with fish fillets and sticks, other items, such as canned fish, shellfish, and fresh fish were included by the Service in its part in the promotion.

Local arrangements for the Service's participation in the Columbus fish promotion were made just as the campaign got under way in September. The actual demonstrations and other contacts listed above were not begun until late October after the efforts of the industry had aroused interest in fish and its preparation. The first Service fish-cookery demonstration in the Columbus area was given at Mount Vernon for 212 cooks and managers from parochial schools in the surround-Formerly Commodity-Industry Analyst (Fisheries) with the Educational and Market Development Section, Branch of Commercial Fisheries, U, S, Fish and Wildlife Service, Washington, D, C.

ing counties. For this group, who use fishery products regularly, emphasis was placed on easier preparation of fishery products in order to encourage greater variety in their menu planning.



Fig. 1 - This is one of two advertisements which appeared each week in the Columbus Dispatch and the Columbus Citizen. The ad for fish fillets was alternated with one on fish sticks in each paper.

NATIONAL FISHERIES INSTITUTE

The second of the demonstrations was a 30-minute guest appearance on a leading TV kitchen show. Time for this appearance was donated by the television station as a public service. A novel recipe for shrimp was included in the recipes prepared. The star of the show cleverly tied in an NFI paid commercial on fillets to one of the Fish and Wildlife Service recipes, using the finished dish as an example of what can be done with fillets.

The Columbus Naval Air Station and the Lockbourne Air Base were the respective hosts for the third and fourth fish-cookery demonstrations. At the Naval Station, Navy cooks feeding nearly 2,000 meals daily were present, while at the Lockbourne Air Base, the Air Force and Army cooks responsible for feeding almost 6,000 men daily attended. Since these two bases customarily serve fishery products once a week, the emphasis was on showing different ways of serving fish and shellfish. Suggestions were made on the proper handling of fishery products upon their receipt at the mess halls, so that the fish dishes on the men's trays would meet with greater acceptance, and thus greater consumption.

A group of nearly 180 school-lunch cooks, who feed an estimated 12,000 children daily, viewed the fifth demonstration in Columbus. Here fish sticks in their cooked and uncooked forms gained the most attention, although both canned fish and frozen fillets were also demonstrated. Some in the audience made their first acquaintanceship with fish sticks by tasting those they had seen cooked and displayed during the demonstration. It appeared obvious from the many comments that use of fish in the schools of the Columbus area should show a sharp upward trend as a result of this meeting.

The sixth demonstration, given at Ohio State University, was attended by a group of dietitians and cooks who prepared meals for approximately 10,000 persons daily in the University dining halls and Medical Center. Their primary interest in the demonstration was in learning easy methods of preparing fish which still permitted a superior finished food dish.

The demonstration kitchen of the gas company serving Columbus was the scene of the seventh demonstration. Here personnel from the various State of Ohio and other public institutions in the Columbus area gathered to learn how they might improve the acceptance of fishery products among the 15,000 inmates they feed daily. Most of the cooks and dietitians said but find them selves confronted with preparation serve

they serve fish once a week, but find themselves confronted with preparation, serving, and acceptance problems in feeding fishery products to their groups. The Serv-

ice Home Economist was able to offer suggestions for the solution of their problems in her demonstration of fish and shellfish cookery.

In her eighth demonstration in Columbus, the Service Home Economist introduced fish and shell-fish cookery to a food class organized by the local electric company. Here not only the class, but the home service director of the electric company, and her staff of home economists, benefited from the meeting.

For the ninth and last demonstration given by the Service team in the Columbus area, another local TV station was host and oysters were featured in the guest appearance on their afternoon kitchen show. Oysters were opened, and along with some recipe suggestions on the use of oysters went the reminder to the viewers that even on Thanksgiving and Christmas oysters can well be an important addition to the holiday fare.

Contacts made with the various radio, TV, and newspaper food editors by the Service representatives during the period of the promotion brought out their need for suitable information and pictures relating to fishery products and their use by homemakers. Arrangements were made to supply the food editors with many of the Service periodical publications to supplement those they were already receiving from the National Fisheries Institute and other industry sources. That fishery information and material, especially pictures, are considered of definite value by these editors was amply shown by a review of their food pages in their respective newspapers.

In reviewing the over-all promotion campaign and the contribution made by the industry and the Fish and Wildlife Service, it was evident that the efforts of each organization complemented the other to produce a rounded promotional program. The industry, including the National Fisheries Institute, relied largely on paid advertising for the effect they wished to make on the ultimate consumers. The Fish and Wildlife Service, as a Government agency, was particularly suited for its work with schools, institutions, utility companies, the Armed Forces, and the TV stations of the area.

In the matter of results, again the industry approach plus the Service's efforts, appears to have made for a balanced promotional program. Many of the industry's efforts were designed to create immediate increases in sales. The Service's demonstrations were primarily designed for institutional groups with secondary emphasis being placed

tional groups with secondary emphasis being placed on the home consumer. But more important, the results of the Service demonstrations given should be apparent two to three years from now, as surveys made of similar demonstrations have shown.

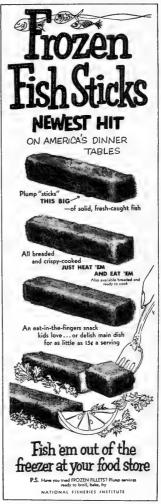


Fig. 2 - This is the fish stick advertisement which was alternated with the one on fish fillets in each of the two newspapers (Columbus Dispatch and Columbus Citizen) each week during the promotion in Columbus, Ohio.

Actual industry opinions of the results of such a campaign are, in the final analysis, the "proof of the pudding" and on this score fish dealers' opinions in the area varied widely. Those dealers whose normal major volume and profit comes from fresh fish naturally were disturbed by the amount of advertising and promotion devoted to frozen products. On the other hand, the sales managers of frozen food distributors who worked closely with the promotional program experienced sharp increases in their fish-stick and fish-fillet sales. The frozen food manager of one very large distributor to retail stores was surprised to note the degree to which movement of all types of fishery products seemed to be accelerated as the fish-fillet and fish-stick promotion campaign gathered momentum. Therefore, while the campaign was basically directed to increase the sale of frozen fillets and fish sticks, increases in the sales of all types of fishery commodities seemed evident.



SHELLFISH CAN ADD VARIETY TO MENUS

To add variety to menus try shellfish, suggests the U. S. Fish and Wildlife Service.

The various species of shellfish are delicate in flavor, light in texture, and require a very short period of cooking. And, best of all, they bring to a meal approximately the same amount of protein, minerals, and vitamins that a serving of meat does.

Among the most commonly-used shellfish in this country are clams, crabs, lobsters, oysters, scallops, shrimp, and spiny lobster tails. These shellfish are marketed in a variety of ways. These market forms, as applicable to the various shellfish, are given below. Choose the market form best suited to the recipe you plan to use.

Hard- and soft-shell crabs, lobsters, oysters, and clams are marketed alive in the shell. Sometimes crabs and lobsters are sold cooked in the shell.

Oysters, clams, and scallops are sold shucked, free from their shell, either fresh or frozen.

Shrimp and spiny lobster tails are usually marketed headless either fresh or frozen. Shrimp are sometimes sold cooked in the shell.

Meatis often removed from cooked shellfish, such as crabs, shrimp, and lobsters, and sold as cooked meat either fresh or frozen.

The following U. S. Fish and Wildlife Service tested recipe is suggested to add variety to your menu throughout the year:

SHRIMP THERMIDOR

Cut large shrimp in half. Fry mushrooms in butter for about 5 minutes. Blend inflour and seasonings; add milk gradually and cook until thick, stirring constantly. Stir in shrimp. Fill six individual well-greased shells or casseroles. Sprinkle with cheese and paprika. Bake in a hot oven, 400° F., for 10 minutes or until cheese browns. Serves six.

IRON SULFIDE DISCOLORATION OF TUNA CANS1/

No. 2 - Analytical Methods

By George M. Pigott* and M. E. Stansby**

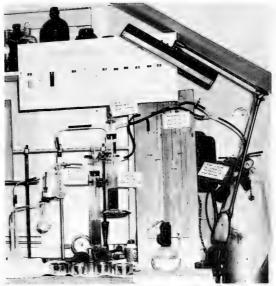
INTRODUCTION

During recent years, black deposits of ferrous sulfide have sporadically occurred in canned tuna on the inside surface of the can area adjacent to the headspace. This paper is the second in a series of six papers in which a study of the mechanism of iron sulfide discoloration is reported (Pigott and Stansby 1955).

The objective of this paper is to present the analytical methods that were used during the investigation. The sulfide analysis will be described in some detail, since the procedure has been improved and adapted for determining sulfide distribution in canned tuna.

SULFIDE ANALYSIS

GENERAL: Sulfide was determined—as hydrogen sulfide—by a modification of Almy's method (Almy 1927) and (Brenner 1953). Inert gas is passed through an acidified suspension of the sample. The acid releases any free sulfide from the suspension as hydrogen sulfide. The gas is then passed through a zinc acetate solution where hydrogen sulfide is converted to zinc sulfide.



Apparatus used for the determination of hydrogen sulfide,

After the run, an oxidizing agent and p-aminodimethylaniline are added. A colorimetric reaction ensues which gives a blue-colored solution of oxidized methylene blue. The reaction can be considered qualitatively as:

* Formerly Chemical Engineer, Continental Can Company, Seattle, Wash.

** Chief, Pacific Coast and Alaska Technological Research, Fishery Technological Laboratory, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Seattle, Wash.

1/ This investigation, which was carried out at the Seattle Technological Laboratory, U. S. Fish and Wildlife Service, was jointly sponsored by the Continental Can Company and the U. S. Fish and Wildlife Service.

The intensity of the blue-colored solution resulting from this reaction is proportional to the amount of H₂S extracted from the sample. The amount of hydrogen sulfide can be determined by reading the percent of light transmission with a photoelectric spectrophotometer and comparing the results with a standard curve.

REAGENTS:

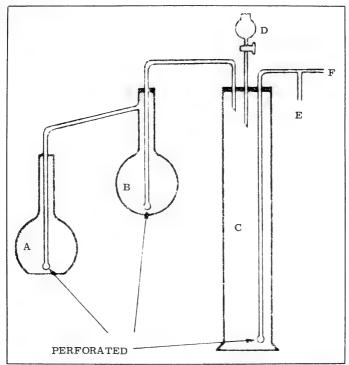
- 1. 1:1 hydrochloric acid.
- 2. 0.04 percent p-aminodimethylaniline hydrochloride. --Dissolve 40 milligrams of p-aminodimethylaniline in 1:1 hydrochloric acid and dilute to 100 milliliters with 1:1 hydrochloric acid. This solution should be prepared fresh daily.
- 3. Ferric chloride. -- Dissolve 27 grams of FeCl₃ · 6H₂0 in 500 milliliters concentrated hydrochloric acid and make to one liter. Before use, dilute 1 part of this standard with 4 parts of water giving an 0.02 normal solution of ferric chloride oxidizing solution.
- 4. Zinc acetate. --Prepare a 20-percent solution of zinc acetate. Before use, this stock solution is diluted to 2-percent zinc acetate solution. A few drops of glacial acetic acid per liter of dilute stock are added to prevent hydrolysis.
- 5. Carbon dioxide cylinder.
- 6. Antifoam agent. (Such as silicone antifoam spray.)

CALIBRATION CURVE: Bubble hydrogen sulfide gas through 500 milliliters of water for approximately one minute. Pipette 10 milliliters of this solution into a 100-milliliter volumetric flask containing about 10 milliliters of 20-percent zinc acetate stock solution. Dilute to the mark with distilled water. To the remaining 490 milliliters of hydrogen sulfide solution, add 20 milliliters of 0.1N iodine solution and back titrate the excess iodine with 0.1N sodium thiosulfate, using starch as an indicator. The above steps involving hydrogen sulfide solutions should be carried out quickly so as to avoid loss to the air.

The zinc sulfide solution should contain approximately 5 micrograms of hydrogen sulfide per milliliter. Add to each of five 50-milliliter volumetric flasks containing about 25 milliliters of 2-percent zinc acetate solution, aliquots of zinc sulfide solution containing 0, 5, 10, 25, and 50 micrograms of hydrogen sulfide, respectively. These standard solutions should be cooled in an ice bath before the color is developed so that a minimum of hydrogen sulfide will be lost. To the cooled solutions, add 5 milliliters of p-aminodimethylaniline and 1 milliliter of diluted ferric chloride solution. Dilute to the mark with 2-percent zinc acetate solution, and mix by gently swirling. Maximum color development takes about one hour at room temperature, after which time the absorption can be read in a spectrophotometer at 745 millimicrons.

Sodium sulfide can be used in place of zinc sulfide in preparing standard solutions. Approximately 1.2 grams of sodium sulfide monohydrate of high purity are dissolved and diluted to one liter in freshly boiled and cooled distilled water. A 100-milliliter aliquot of this solution is then added to a solution containing 200 milliliters of water, 20 milliliters of 0.1N iodine solution, and several drops of 1:1 hydrochloric acid. The excess iodine is then titrated with 0.1N sodium thiosulfate solution. The standard solutions are prepared as explained previously.

APPARATUS:



- A. 100-milliliter volumetric flask.
- B. 80- to 100-milliliter round bottom distilling flask,
- C. Aerating cylinder about 5 centimeters diameter and 38 centimeters high.
- D. Dropping funnel of at least 60 milliliters capacity.
- E. Manometer (water).
- F. CO₂ cylinder.

PROCEDURE:

- 1. Clean apparatus thoroughly and rinse in distilled water.
- Place 25 grams of finely ground, weighed samples into aerating cylinder which contains about 50 milliliters of distilled water.
- 3. Add antifoam to sample if necessary.
- Place 30 milliliters of 2-percent zinc acetate solution in side-arm flask and 20 milliliters of zinc acetate solution in 100-milliliter volumetric flask.
- 5. Apply glycerine to each rubber stopper to insure a good seal.
- 6. Place all stoppers in position, thus sealing apparatus from leaks.

- 7. Add 50 milliliters of 1:1 hydrochloric acid through dropping funnel, leaving a few drops in funnel to insure seal.
- 8. Bubble carbon dioxide through acidified suspension for 15 minutes at 400 millimeters water pressure.
- 9. Stop carbon dioxide flow, and transfer the solution from the sidearm flask to the 100-milliliter volumetric flask, washing with 2percent zinc acetate. The final volume in the 100-milliliter volumetric flask should be about 90 milliliters of solution. It is very important always to let the color develop in the same volume.
- 10. Add 5 milliliters of 0.04-percent p-aminodimethylaniline solution.
- 11. Add 1 milliliter of diluted ferric chloride solution.
- 12. Let color develop 1 hour or more, dilute to mark, and read.

PREPARATION OF SAMPLES: Meat: Samples of tuna meat are prepared for analysis by homogenizing a representative sample. A food chopper is much more satisfactory for preparing tuna meat than is a blender.

 $\underline{\text{Canned}}$ $\underline{\text{Product}}$: To obtain the sulfide distribution in a canned product, the following procedure was found satisfactory:

- 1. Wash and rinse exterior of can thoroughly.
- 2. Place 20-percent zinc acetate solution on the lid. (The seam makes a dam that holds the solution on the lid.)
- 3. Puncture the lid with vacuum gauge, and slowly allow zinc acetate to be drawn into the can, using the gauge point as a throttling device in hole to control the rate of liquid addition.
- After the vacuum gauge has fallen to zero, keep the hole covered and shake can vigorously to allow zinc acetate to react with hydrogen sulfide and form stable zinc sulfide,
- 5. Open can and homogenize sample in the usual manner.

The results obtained from analyzing this sample will give the total sulfide in the can. When determining the sulfide content of the meat plus liquid, the sample of meat and liquid is taken from the opened can after the headspace gas has escaped. The difference between the total sulfide and the sulfide in meat plus liquid is the amount of hydrogen sulfide in the headspace.

OTHER ANALYSES

Headspace gases were analyzed for volatile acids, volatile bases, oxygen, and hydrogen, using a modification of the Van Slyke manometric apparatus (Landgraf 1954).

Can vacuum was determined with a Bourdon-type can vacuum gauge. All vacuums were taken on the outer bead radii of the lid, in an effort to minimize the vacuum decrease due to pressing the top of the can.

The height of the headspace was measured with a Starrett depth gauge.

The pH was determined with a Beckman glass electrode.

A visual inspection was made on all cans that were opened to detect the extent of discoloration in the can and any abnormality in the meat. Can discoloration was arbitrarily judged as none, light, medium, or heavy. Tin sulfide staining (underfilm staining) was noted, but since this is not objectionable from the commercial point of view, no effort was made to judge the amount caused by different variables.

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VOLUME MARKETS FOR FISHERY PRODUCTS--LOCKER PLANTS

The locker-plant industry is steadily developing into an important volume market for frozen fishery products. Symbolic of this trend is the change in emphasis--a locker plant is now classified in the trade as a "Frozen Food Center."

In a survey of the frozen food centers or locker plants in New Jersey in 1954, a U. S. Fish and Wildlife Service fishery marketing specialist found that only 26 plants out of a total of 54 sold fishery products. Yet, these 26 plants sold 163,970 pounds of fishery products annually, an average of 6,300 pounds a plant each year, or about 525 pounds per plant a month. If each of the almost 11,000 locker plants in the United States were to sell 525 pounds of fishery products a month, the locker-plant industry would provide a market for $5\frac{1}{4}$ million pounds of fishery products a month or 69 million pounds annually. Because of this tremendous potential, the Service's educational and market development program includes working closely with members of this industry.



OXIDATIVE DETERIORATION IN FISH AND FISHERY PRODUCTS -- NO. 1

SCOPE OF PROGRAM

Among the most adverse alterations which occur spontaneously in fish and fishery products are those involving oxidation of oils, pigments, and other chemical components of the fish. These changes give rise to deterioration in the flavor and odor, development of off-colors, and diminishment of nutritive value. The chemical composition of the oils may become so altered that the value of the extracted oil is lessened for certain industrial applications.

While considerable research has been carried out on oxidation of oils and pigments in animal and vegetable products, work along these lines with marine prod-



Fig. 1 - Food Technology Building, University of California, Davis, Calif.

ucts has been extremely limited. Much needed basic information as to what the mechanism of such oxidations is and how it can be controlled is lacking.

A new program with Saltonstall-Kennedy funds was inaugurated in August 1955 by the U. S. Fish and Wildlife Service to make a thorough study of these problems. In a collaborative program, Service employees are stationed in the laboratories of the Food Technology Department of the University of California to undertake this research.

PERSONNEL AND FACILITIES AT UNIVERSITY OF CALIFORNIA: The Food Technology Department of the University of California operates with Dr. Emil Mrak as head of the department on two of the campuses of the university. The main laboratories are located at Davis, Calif., where the program is now under way. Dr. A. L. Tappel of this department at Davis has had considerable experience in the field of oxidation in food products other than fish. He received his doctor's degree under Dr. Lundberg of Hormel Institute and hence is well trained in the field of oil chemistry. He has published a series of papers on the mechanism of oil oxidation in food products such as meat. Under the Service's new program, this research is now being extended to oxidation in fishery products.

The Food Technology Department occupies a new building at Davis, with the best of equipment for research in the field of food technology. The building is located adjacent to the Poultry Husbandry Department, where the Fish and Wildlife Service has another collaborative program under way on nutritive value of fish meal. This makes possible close collaboration on those phases of the oxidation program dealing with changes in the nutritive value of fish meal caused by oxidation of the oil or of other components in the meal.

Dr. Harold Olcott has been employed by the Institute of Marine Resources of the University of California to inaugurate work by the University in the field of fishery technology. This program operates through the Food Technology Department, and Dr. Olcott will work on the Berkeley campus of the University of California. A part of the Fish and Wildlife Service's collaborative program will be supervised by Dr. Olcott. Much of the basic research in the field of mechanism of vegetable-

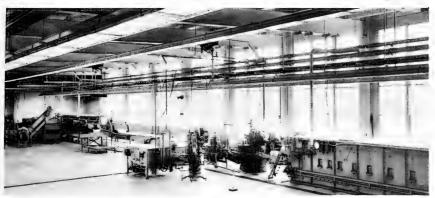


Fig. 2 - Canning equipment and general view of the processing laboratory, Food Technology Department, University of California, Davis, Calif.

and animal-oil oxidation and action of antioxidants was carried out by Dr. Olcott when he was working with Dr. Mattil at the University of Iowa. That portion of the Service program dealing with oxidation of extracted fish oils will be carried out under Dr. Olcott's supervision.

The Fish and Wildlife Service now has two full-time and one part-time chemists, as well as one part-time food technologist and one part-time laboratory aid working on this program at the University of California. A good start has already been made on some phases of this work.

PROGRESS MADE ON PROGRAM

GENERAL APPROACH TO THE PROBLEM: Two phases of the program are now under way. One of these on which most of the work up to now has been concentrated is a study of the mechanism of oxidation of fish oils while present in the meat of fish. This phase is basic to applications, whether involving changes in oil in the stored meat of fish, or in fish meals, or in the oil itself because in all these cases the oil starts out in the meat and some changes always take place initially in the meat before any manufacturing steps have been started. Accordingly, chief emphasis in the initial stages of the work will be toward elucidating the mechanism of oxidation of oil in the meat of fish. Some work is proceeding concurrently in collaboration with the Poultry Husbandry Department of the University of California on ox-

idation of oil in fish meal. Work on oxidation of pigment and on oxidation of extracted oil will get under way later. The latter program will eventually be carried out at Berkeley as soon as the Institute of Marine Resources' new laboratory for fishery technological work at Berkeley is completed.

<u>HEMATIN COMPOUNDS IN FISH</u>: Work began on the first phase of the program by the analysis of a number of species of fish for their content of hematin compounds, substances which have been shown to be powerful biocatalysts for oil oxidation in other foods. Nine species of fish were examined, and hematin compounds were present in all samples, the content varying from $5.4 \times 10^{-9} M$ in pilchard down to $0.1 \times 10^{-9} M$ in cod.

EFFECT OF HEMATIN COMPOUNDS ON FISH-OIL OXIDATION: The effect of hematin compounds in the meat of fish on catalysis of oil oxidation was next determined. This determination was carried out by measuring the amount of oxygen uptake of a salt of an unsaturated fatty acid, ammonium linoleate, when subjected to aeriation

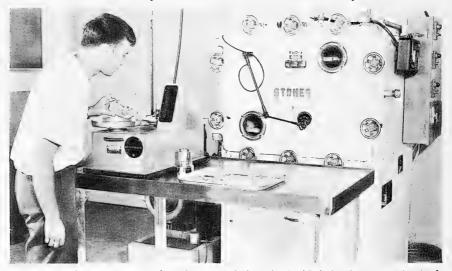


Fig. 3 - Weighing freeze-dried meats (the freeze drier is in the background) at Food Technology Department, University of of California, Davis, Calif.

in a Warburg respirometer. The reaction was carried out at 20° C, at a pH of 9.0, and extracts of fish were added to the ammonium linoleate substrate to determine their effect on the oxidation rate. The fact that the catalysis was due primarily to hematin compounds and not to some other biocatalysts in the fish was confirmed by repeating the experiment in the presence of cyanide, in which case no catalytic effect resulted. Cyanide inhibits hematin catalysis of unsaturated fatty acids.

In another series of experiments (1) cubes of fish meat and (2) extracted fish oil from different species were measured for rate of oxygen uptake in a Warburg apparatus.

The results of all these experiments showed a correlation between the hematin compound content of the various species of fish and the catalytic effect of fish extracts on the linoleate oxidation. The rate of oxidation of the meat of fish also was correlated with the content of hematin compounds.

<u>CATALYTIC</u> <u>EFFECT</u> <u>OF PROTEINS ON FISH-OIL OXIDATION</u>: Some experiments were carried out to determine the effect of various proteins on the catalytic oxidation of fish oils. It was shown that all proteins studied had a measurable effect but that none of the proteins investigated approached hemoglobin in activity, in this respect.

ANTIOXIDANTS: Work is now under way to appraise the effect of antioxidants on the rate of oxidation of fish oils in fish meat. Antioxidants being investigated include d-tocopherol and certain compinations of synergistic compounds previously developed by the Food Technology Department of the University of California for use with other food products.

OXIDATIONS IN FISH MEAL AND EFFECT ON NUTRITIVE VALUE: Some work has been started on investigation of the mechanism of alteration in nutritive value of fish meals which accompanies heating and oxidation of the oil in such meals. This program is being carried out jointly with Dr. Grau of the Poultry Husbandry Department. Three possible mechanisms are being considered:

- 1. Copolymerization of lipids with protein.
- 2. Formation of carbonyl-amine browning reaction products by combination of lipid oxidation products with protein of the fish meal.
- $\it 3.$ Oxidation of oxygen-labile amino acids to form products of lowered nutritive value.

Some evidence has been obtained to indicate that mechanisms 1 and 3 are possible, and further work is continuing.

Considerable work is under way in the Food Technology Department on another project on the browning reaction occurring with dehydrated meat. Experience gained in this other project is being applied to investigation of the role of browning in fish meal and its effect on nutritive value.

--W. BROWN, FISH AND WILDLIFE SERVICE CHEMIST,
FOOD TECHNOLOGY DEPARTMENT, UNIVERSITY OF CALIFORNIA,
--A. J. TAPPEL, FOOD TECHNOLOGY DEPARTMENT,
UNIVERSITY OF CALIFORNIA;
--M. E. STANSBY, CHIEF, PACIFIC COAST AND ALASKA
TECHNOLOGICAL RESEARCH,
BRANCH OF COMMERCIAL FISHERIES,
U. S. FISH AND WILDLIFE SERVICE, SEATTLE, WASH.



COMPOSITION OF FRESH-WATER FISH--NO. 1

INTRODUCTION

Information on the composition of fish is of basic importance and is essential if fish are to be utilized to the best advantage. From a technological standpoint, knowledge of the makeup of fish is necessary in the application of methods of preservation or in attempts to utilize it as a food staple or in the preparation of industrial products from the whole fish or the waste portions.

Examples of the importance of composition can be found in every phase of fishery technology. In processing fish for human consumption, a knowledge of the chemical composition of the fish will help to determine the most suitable processing methods. The difficulties encountered in the storage of frozen fish can be more readily overcome if the amount and nature of the oils present in the meat are known. A

knowledge of the oil content of the fish will also help to determine the most suitable method for processing fish waste into meal and oil.

Over many years much data on the composition of fish have appeared in the literature. Unfortunately, many of these data are worthless to workers in the field because the samples used for the analyses were too limited and did not take into consideration the variation occurring within species or with season. In most instances there has not been enough information given concerning the samples that the results could be included in the determination of either average values or a range of values for the species.

In the present project, samples of various species of fresh-water fish are being analyzed for their moisture, oil, protein, and ash contents.

SAMPLES

The samples of fresh-water fish used for these analyses were obtained in the Great Lakes, Mississippi River, and small lakes in Minnesota and Wisconsin. The fish were shipped to Seattle either in ice or frozen. The analyses were done on the edible meat portions and on the waste trimmings. The samples of the edible meat

Table 1 - The Oil Content of Sheepshead (Aplodinotus grunniens) from Several Sources							
			aught	Fish in Lot	Oil Content of Fish		
Body of Water	State	Month Year			Maximum Average Mini		Minimum
				Number	(Percent)		
1		Oct.	1951	16	8.60	5.97	2.70
Lake Erie	Ohio	June	1952	16	10.30	6.90	2.20
(Aug.	1954	16	9.65	6.04	1.17
(May	1952	16	13.09	7.15	1.87
	Iowa	May	1953	15	14.20	8.39	1.45
	(Clinton)	Aug.	1953	16	11.30	7.34	1.52
Mississippi	(Clinton)	June	1954	16	14,20	8.78	3.57
River Wisco (La (June	1955	16	13.30	5.50	3.23
	Wisconsin (LaCrosse)	Aug.	1953	11	16.00	9.68	2.61
	Minnesota (Lake Pepin)	Aug.	1955	16	20.36	11.53	5.54
(July	1953	16	15.30	2.72	0.56
Lake	Wisconsin Jan. Sept.	Jan.	1954	16	3.83	1.53	0.50
Winnebago		Sept.	1954	16	14.60	2.70	0.91
	i	Feb.	1955	16	15.34	4.04	0.74
Red Lake	Minnesota	Aug.	1954	16	9.10	4.33	1.63
Clearwater Lake	Minnesota	May	1953	16	1.67	1.04	0.72
Lake Kegonsa	Wisconsin	Oct.	1954	16	8.84	4.89	2.00

were prepared as follows: The fish were filleted. Then the fillets were skinned, retaining as much as possible of the oil deposited directly beneath the skin. The two fillets from a single fish were ground through a Hobart food cutter for 6 minutes, the machine being stopped after each 2-minute period in order that the contents of the cutting bowl could be mixed. After the meat of the fish was thoroughly ground and mixed, the sample was vacuum-sealed in $\frac{1}{2}$ -pound tin cans and frozen. The waste from each lot of fish was composited and treated in the same manner as the fillets. The samples were stored at $0\,^{\circ}$ F. until the analyses were run. The samples were then thawed, again thoroughly mixed, and finally weighed for the determinations.

SHEEPSHEAD SELECTED FOR THOROUGH COVERAGE

Attempts to determine the variation within a species are an important part of this project on composition. It was not possible to follow through on all species a series on the effect of location of catch, seasonal variation, and yearly variation. In attempts to select a species for a thorough study, sheepshead (Aplodinotus grunniens) appeared to be an excellent choice. More markets are needed for sheepshead, and they are extensively distributed, being found from Guatemala to Alberta, Canada, and from the Rocky Mountains to the Appalachians. They are caught in commercially-important quantities in the Great Lakes, smaller lakes, and rivers.

OIL CONTENT: The greatest variation in the composition of sheepshead appeared to be in the oil content. The oil analyses reported in table 1 show that a wide range usually occurred even among the fish found in a single lot caught at the same time in the same location; if all lots are considered, the oil content varied somewhat more widely, the content ranging from 0.72 percent to 20.36 percent. Even the averages for the various batches ranged from 1.04 percent to 11.53 percent.

If only 16 sheepshead (a much larger sample than that for most values reported in the literature) from Clearwater Lake, Minn., had been used as representative of all sheepshead, the oil content would have been reported as ranging from 0.72 to 1.67 percent and as averaging 1.04 percent. Sheepshead would then have been considered a non-oily fish. If only sheepshead had been used from another small lake, Lake Kegonsa in Wisconsin, the oil would have been reported as ranging from 2.00 to 8.84 percent and as averaging 4.89 percent. Sheepshead would then have been considered as intermediate in oil content. However, if 16 samples of sheepshead from the Mississippi River had been taken in June 1954, values from 3.57 to 14.20 percent and averaging 8.78 percent would have been found. Then sheepshead would have been classified as an oily fish. This is an example of the danger of analyzing one fish, or even one large lot of fish from the same source, and reporting that the values obtained are representative for that species.

In considering location, it is interesting to note that the sheepshead caught in the Mississippi River apparently contain the most oil and that those from the small lakes apparently contain less oil than do those from either Lake Erie or the Mississippi River.

The effect of season on the oil content is not as clearcut as is the effect of location. Although apparently some variation occurs due to season, more samples taken during different times of the year must be analyzed before a definite statement can be made. It is also interesting to note that comparatively little variation occurs among the samples obtained in successive years from the same site on the Mississippi River.

PROTEIN, ASH, AND MOISTURE CONTENT: As already indicated, the range in oil content was by far the greatest variation found in any of the constituents for which an analysis was made in the sheepshead. In this same group of samples, the protein content ranged from 14.5 to 19.9 percent, and the ash content ranged from 0.87 to 1.29 percent. Since the moisture content is related to oil content, a greater variation occurred. The range was from 66.8 to 84.8 percent. The variations and the wide range occurring in sheepshead serve to emphasize the importance of not considering the composition of a species of fish to be established by the analyses of a few fish caught at the same time.

MISCELLANEOUS FRESH-WATER FISH

In addition to the more thorough study that is being conducted on sheepshead, 16 other species have been analyzed for their proximate composition. The analysis of one species of fish gave spectacular results. Siscowets lake trout (Cristivomer

namaycush siscowet) had an exceedingly high-oil, low-protein, and low-moisture content. The range of oil content of 15 fish was from 6.7 percent to 64.2 percent. The protein ranged from 5.9 to 17.8 percent, and the moisture content ranged from 27.8 percent to 74.8 percent. All of these fish were caught in Lake Superior in September, and therefore the variation is due, not to seasonal or geographical factors, but to individual differences.

There is much interest in increasing the utilization of lake herring. We have analyzed one lot of this species and have more from various areas to analyze. One observation that may be made is that, although the name "herring" referring to salt-water fish makes one think of an oily fish, lake herring apparently have a low oil content. In the lot analyzed, the oil ranged from only 0.86 percent to 2.87 percent.

Many species of fresh-water fish, both commercially-important and "trash" or noncommercial fish, are yet to be analyzed, and additional batches of the species that have been tested must be analyzed before values for composition can be established.

--NEVA KARRICK, CHEMIST,
--WILLIAM CLEGG, FORMERLY CHEMIST,
--MAURICE E. STANSBY, CHIEF, PACIFIC COAST
AND ALASKA TECHNOLOGICAL RESEARCH,
FISHERY TECHNOLOGICAL LABORATORY,
BRANCH OF COMMERCIAL FISHERIES,
U. S. FISH AND WILDLIFE SERVICE, SEATTLE, WASH.



LAKE HERRING SAMPLES COLLECTED FOR COLD-STORAGE STUDIES

The program in collaboration with The Refrigeration Research Foundation at the Service's Seattle Fishery Technological Laboratory includes work on the coldstorage life of fresh-water fish. One important fresh-water species with which some difficulty in holding in the frozen state has occurred is lake herring. During November 1955, the Seattle Laboratory procured and put up samples of this species from three runs in the Great Lakes. These fish are caught in large quantities during a brief period in late November and early December. Two important runs of fish occur in Lake Superior and one in Lake Huron. In Lake Superior, one occurs adjacent to Duluth, the other along the north shore of the lake. The fish taken in the three runs are somewhat different and may have differing storage life. Samples of all three runs were taken, processed, frozen in different ways, and transferred to Seattle where storage tests will be run at suitable intervals.



WEIGHT LOSS FOR FISH STICKS STORED AT 0° TO 5° F.

The changes in weight which occurred in 7 different commercial packs of fish sticks, under several different storage conditions, were observed and recorded over a period of 8 months. One storage series consisted of 3 weighed packages of each of 7 commercial brands stored under theoretically optimum conditions. The packages were sealed in master cartons, and placed inside a large wooden box in a still-air cold-storage (0 $^{\circ}$ to 5 $^{\circ}$ F.) room.

In the course of the study, all packs stored under these conditions, with one exception, lost approximately 1.2 percent of their respective initial weights. These

packs were packaged in a waxed chipboard container with a glassine laminate and overwrapped with a microcrystalline wax paper. The exception, which lost approximately 4.1 percent of its initial weight, differed only in that the waxed chipboard container did not have a glassine laminate. It would seem that the laminate, in addition to preventing staining of the chipboard container by the oil in the fish sticks, may also afford some protection from dehydration during storage.



CRAB MEAT FEDERAL SPECIFICATIONS

Federal specification PP-C-651 (Crab Meat: Canned) was revised in view of comments from industry and interested Federal agencies. The revised draft was submitted to General Services Administration for issue as an "Interim specification." The specification was developed by the U. S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces, based upon currently available technical information. It will be recommended that Federal agencies use it in procurement and recommend changes if necessary. The Interim specification is subject to modification.

Interim specification PP-C-00656a (Crab Meat, Cooked: Chilled and Frozen) was revised in view of industry and Federal agency comments, and submitted to General Services Administration for promulgation into a Federal Specification.



PREPARATION OF MULLET ROE

Dried mullet roe is prepared to a limited extent along the south-eastern coast of the United States, from North Carolina to Florida. The unbroken roe bags are placed in tubs where they are either sprinkled with salt or soaked in strong brine. About 5 quarts of salt are added to each 100 pounds of roe. Too much salt will cause the egg sacks to break. After the roes have remained in the brine for 10 to 12 hours, they are drained and spread on boards in the sun to dry. They are taken in each night to prevent their becoming wet by dew. During fair weather the drying process requires about a week. The finished product varies in color from a yellowish brown to a dark-red.

When the drying process is completed, the roe may be dipped in a mixture of melted beeswax and paraffin and held for a considerable period of time at room temperature. It can be kept for much longer periods under refrigeration at 40° to 50° F. The mixture of 50° percent wax and 50° percent paraffin prevents further loss of moisture in the preserved roe. In some cases this product has been smoked with a cool smoke immediately after brining. Only a very light smoke is used for approximately 30° minutes at just sufficient heat to burn the sawdust. This adds to the keeping quality and flavor of the final product.

--The Marine Laboratory, University of Miami, Coral Gables, Fla.



Additions to U.S. Fleet of Fishing Vessels, November 1955

A total of 25 vessels of 5 net tons and over were issued first documents as fishing craft during November 1955, according to the Bureau of Customs. Compared with the 36 newly-document-

ed fishing craft reported for II S Vessels Issued First Documents as Fishing the corresponding month of the previous year, this was a decrease of 31 percent.

During November 1955 the Chesapeake arealed all others with 7 newly-documented craft, followed by the Gulf area with 5, the Alaska area with 4, the South Atlantic area with 3, and the Pacific and Great Lakes areas with 2 each. The New England and Middle Atlantic areas each had 1 addition.

sels was documented for the

U. S. Vessels Issued First Documents as Fishing								
Craft, November 1955 and Comparisons								
Area	November		JanNov.		Total			
Area	1955	1954	1955	1954	1954			
	(Number)							
New England	1	-	18	22	23			
Middle Atlantic	1	1	13	15	15			
Chesapeake	7	7	51	91	93			
South Atlantic	3	4	64	114	119			
Gulf	5	13	97	306	313			
Pacific	2	7	112	111	117			
Great Lakes	2	-	9	5	6			
Alaska	4	2	35	26	27			
Hawaii	-	-	3	1	1			
Puerto Rico	-	2	-	2	2			
Unknown	-	-	-	1	1			
Total	25	36	402	694	717			

During January-Novem-Note: Vessels have been assigned to the various areas on the basis of registered home ports.

first time as fishing craft, compared with 694 for the corresponding period of 1954-a decrease of 42 percent. During the 1955 period, the greatest decrease occurred in the Gulf area -- a decline of 68 percent.



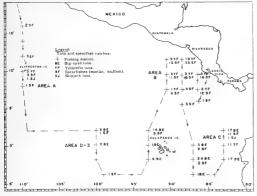
California

DISTRIBUTION OF YELLOWFIN AND BIG-EYED TUNA INVESTIGATED BY "N. B. SCOFIELD" (Cruise 5): Exploring the distribution and relative abundance of yellowfin and big-eyed tuna in the areas investigated by EASTROPIC was the principal objective of cruise 5 of the California Department of Fish and Game vessel N. B. Scofield. It is hoped that the catch data of this cruise combined with the intensive oceanographic observations of other EASTROPIC vessels may shed more light on the distribution and relative abundance of the tunas in the eastern Pacific.

This cruise was part of a series (EASTROPIC) being conducted jointly by the U. S. Fish and Wildlife Service, Japan, Canada, and private scientific institutions to study the physical oceanography, biological conditions, and other scientific phenomena over wide areas of the Pacific Ocean.

A secondary objective of this N. B. Scofield cruise was to make limited oceanographic observations and biological collections pertinent to tuna life history.

For this cruise the California Department of Fish and Game provided the vessel for long-line fishing and limited oceanographic observations, and Scripps Insti-



N. B. Scofield tuna long-line Cruise 55-S-5.

tution of Oceanography provided certain essential oceanographic equipment and shoreside analysis of data.

The N. B. Scofield departed Los Angeles Harbor September 29, 1955, and proceeded to Station #1 of Area A. Stations #1 to #9 of this area were occupied as scheduled. Due to heavy seas, operations could not be carried on at the remaining stations. The vessel then proceeded to Area D-3 and consecutively occupied Stations 16 to 45 before putting in at Puntarenas, Costa Rica, for fuel and provisions. Departed Puntarenas at 2200 hours, November 4, 1955, and occupied Stations 46 to 61. After completing Station 61 on November 16, 1955, the vessel pro-

ceeded to Los Angeles Harbor arriving November 30, 1955.

<u>Long-Line Fishing:</u> Forty baskets of sardine-baited long-line gear, 11 hooks per basket, were set from 0600 to 0730 hours. While the gear fished from 0730 to 1230 hours, three lures were trolled from the starboard side of the vessel along the length of the set. Retrieving commenced at 1230 hours and was generally completed by 1500 hours.

At each long-line station 2 depths were fished by using 20 baskets with 15-fathom float lines and 20 baskets with 5-fathom float lines. Depths of fishing were approximated by the use of chemical sounding tubes. The average depths fished by the shallowest and deepest hooks were:

15-Fathom	Float Lines	5-Fathom	Float Lines
Deep Hook	Shallow Hook	Deep Hook	Shallow Hook
64 Fathoms	40 Fathoms	55 Fathoms	30 Fathoms

Tuna catches were the poorest in the outlying oceanic waters such as areas A and D-3. The best catches of tuna, up to 6.03 per 100 hooks, occurred in Area C. This area under observation by EASTROPIC encompasses the dividing line between the warm water of the Equatorial Countercurrent and the colder water of the Peru Current. The area of greatest temperature change occurred on November 11 along longitude line 87 W. from 1 45 S. latitude to 2 47 S, latitude. Long-line station 52 was made on the northern edge of this area and produced the best catch of the expedition--6.03 big-eyed tuna per 100 hooks. Most of these fish were well over 70 pounds each.

Twenty lancetfish, <u>Aleposaurus borealis</u>, were taken on the long-line gear at the stations west of the <u>Galapagos Islands along</u> the equator. One lancetfish caught at station 20 is believed to be a new southern distribution record for this species.

During the entire cruise not one station produced a catch of yellowfin and bigeyed tuna together. Practically all the yellowfin tuna were caught in Area B off Central America, while the entire big-eyed catch came from the areas along and immediately south of the equator.

Oceanographic Observations: (1) Bathythermograph observations originally scheduled every two hours while under way were discontinued after the first week because of a breakdown of the power winch. By using the forward plankton tow winch it was possible to take a BT on each long-line station and one at the night light station in the evening.

Fishing Statistics								
Item Area A D-3 Galapagos B C A						All Areas		
Long-line stations	5	4	3	10	7	29		
Total baskets fished	191	160	120	399	256	1126		
Total hooks fished	2070	1732	1303	4331	2767	12203		
Yellowfin per 100 hooks	0.14	0.00	0.00	0.97	0.00	0.37		
Big-eyed per 100 hooks	0.00	0.23	1.61	0.00	2.31	0.73		
Spearfish per 100 hooks	0.53	0.12	0.38	2.49	0.90	1.32		
Sharks per 100 hooks	2.32	0.40	0.23	4.36	1.73	2.52		
Total catch per 100 hooks.	4.35	2.08	2.69	8,20	7.01	5,90		

- (2) Surface water samples for salinity determinations ashore were taken at each long-line and night light station,
 - (3) The 6,000-fa, fathometer was inoperative the entire trip.
- (4) Surface water temperatures were taken every hour when possible and from every $\frac{1}{2}$ hour to 15 minutes when more critical observations were needed for delineating water masses in Area C.
- (5) GEK observations were not taken because of mechanical difficulties with the set previous to departure.
 - (6) Fishing gear drift data at each long-line station was kept as scheduled.

<u>Biological Activities:</u> (1) Tagging: All viable yellowfin tuna, big-eyed tuna, sailfish, and marlin were tagged with type G tubing tags and Woods Hole dart tags. Ten marlin and sailfish were tagged exclusively with dart tags while 72 tuna and skipjack were tagged alternately with dart and tubing tags.

- (2) Morphometric measurements were taken on 3 yellowfin tuna and 5 big-eyed tuna. Further measurements will be taken on specimens preserved for study ashore.
- (3) Complete bridge records were kept of all marine life observations during the entire expedition. Considerably more tuna schools, porpoise, and bird flocks occurred in Areas B and C than in the other areas. In Area B alone, 18 porpoise schools were observed and was more than all the other areas combined. Exceptionally large concentrations of colony-forming tunicates (Pyrosoma sp.) were observed at the stations along the equator from Area D-3 to the Galapagos Islands.
- (4) Sexual maturity studies: Notes were made on the degree of sexual maturity for all fish hauled aboard. All of the large yellowfin tuna caught off Clipperton Island were in an advanced stage of development and would have probably spawned in the near future. The smaller troll-caught tuna, 90 cm. fork length and under, showed no development whatsoever. Off Central America indications were that at least a few of the fish, 110 cm. and under, were just starting to develop. All of the large yellowfin, 110 cm. to 160 cm., caught in this area were in a more advanced stage of development. One female big-eyed tuna caught west of the Galapagos Islands had very probably just spawned.
- (5) Trolling was carried on the length of the long-line set while the gear was fishing and also between stations. Very few stations produced any significant num-

bers of troll-caught tuna. Of the troll-caught tuna practically all came from Area B, and were below 90 cm. in length. Fifty percent of the long-line catch in this area was also in this same size group.

- (6) Stomach samples were saved from as many tunas and spearfishes as practicable. Preliminary examination indicates the major items of food, were squid and crabs.
- (7) A plankton tow to a depth of 300 meters (cable out 450 meters) was taken at all stations.
- (8) Night light stations varying from half an hour to an hour were made between each long-line fishing station. An interesting highlight of the night light work was the collection of a rare member of the family Astronesthidae. These fish, commonly called snaggletooths, generally inhabit the depths of the ocean and are seldom seen or caught at the surface. Tuna-like larvae were collected at Socorro and Clipperton Islands.

Note: See Commercial Fisheries Review, January 1956, p. 33.

* * * * *

SECOND TAGGED STURGEON RECOVERED: Another sturgeon tagged on September 29, 1954, by California's Department of Fish and Game in San Pablo Bay, Calif., was recovered December 5, 1955, off the mouth of the Columbia River near Astoria, Ore.

This recovery brings further verification of the fact that there is an interchange of the big fish between the Sacramento and Columbia River systems.

The second migrant taken was a 41-inch green sturgeon, caught by a commercial fishing boat and returned to California by the Oregon Fish Commission.

Note: See Commercial Fisheries Review, October 1955, p. 48.



Federal Purchases of Fishery Products

FRESHAND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, NOVEMBER 1955: The Army Quartermaster Corps during Novem-

Purchases of Fresh and Frozen Fishery Products by Department of Defense (November and the First 11 Months of 1955)

			212 0 11 01120	01 1000	-/			
QUANTITY			VALUE					
Nove	mber	Jan.	Nov.	November		Jan.	Nov.	
1955	1954	1955	1954	1955 1954		1955	1954	
(M	(Millions of Pounds)			(Millions of Dollars) .				
1.9	2.3	23.2	23.3	0.9	0.9	10.0	9.6	

ber 1955 purchased 1.9 million pounds (valued at \$0.9 million) of fresh and frozen fishery products for the use of the U. S. Army, Navy, Marine Corps, and Air Force. This was a decrease of 2.4 percent in quantity and 2.0 percent in value as compared with October purchases. No-

vember 1955 purchases were lower by 16.5 percent in quantity and 8.2 percent in value than the purchases for November 1954.

Purchases of fresh and frozen fish for the first eleven months in 1955 totaled 23.2 million pounds (valued \$10.0 million)—lower by 0.4 percent in quantity, but higher by 4.7 percent in value as compared with the first eleven months of 1954.

Prices paid for these fishery products by the Department of Defense in November 1955 averaged 44.1 cents a pound as compared with 43.9 cents in October 1955 and 40.3 cents in November 1954.

Chesapeake Bay Fisheries Trends, 1955

The principal developments in the fisheries of Chesapeake Bay in 1955 were (1) an increase in the harvesting of oysters and (2) a decrease in net fishing. Good catches were reported for alewives, menhaden, crabs, oysters, surf clams, soft clams, scup, and sea bass. Moderate catches were indicated for croaker and sea trout, and although they were better than for any immediately preceding year they were still far below the average catches which

once were common for these species. Spot was fairly abundant during the year, reports the Service's Fishery Marketing Specialist in

Virginia.

Oysters: Hurricanes plagued the Bay area as they did in 1954. Oyster grounds suffered the greatest damage from the hurricanes. The high winds caused serious damage in some cases, but even more destructive were the heavy rains. Oyster mortality was extreme where freshets wiped out salinity. Despite these losses, over-alloyster production equaled if it did not gain over the previous year, which was a good one. There was an excellent demand for oysters for frozen soups, stews, and other packs. Since standard, or small-size oysters were desired for this purpose, the price gap between these and selects narrowed. At the end of the year the highest ex-vessel prices ever known in the Chesapeake Bay area were paid for oysters.

In Virginia's James River, where most of the seed oysters used by the extensive planting industry come from, there was a steady and profitable production by the hun-



dreds of boats working there. Hurricane effects lessened the volume somewhat because they dispersed the oysters to a certain extent and tongers had to spend more time in locating oysters. However, it was generally agreed that this spreading was beneficial because it would eventually enlarge the producing grounds.

At the beginning of the year crabs in the winter fishery were almost non-existent. Crab-meat packers turned to Southern States for a supply, importing crabs, principally from North Carolina, until the spring runs (which came unusually late) appeared. But once the season was under way, both hard and soft crabs were plentiful.

<u>Fresh-Water Fishery</u>: In the fresh-water areas new life was injected into the carp and catfish fisheries by an apparently insatiable demand for live fish for stocking inland ponds. A fleet of tank trucks was busy all year collecting them. Snapper turtles also were vigorously sought to meet the demands of a company producing frozen snapper soup.

Alewives: Alewives, running in abundance, exceeded the needs of the canning and salting companies, which have been finding it increasingly difficult to market their products.

 $\underline{\text{New}}$ Products: There was little adventuring in new products. One firm introduced a clam soup made up of a combination of surf clams and hard clams. Dur-

ing the periods when crab meat was cheap, packs varying from canned flakes to frozen deviled crabs were put up. Sizable packs of three products (tuna, fish sticks, and shrimp), the raw materials for which do not originate in the Chesapeake Bay, were reported as in the last few years.

Menhaden: Although Virginia's byproducts processors did not foresee a menhaden catch equal to the record breaker of 1954, the 1955 catch actually passed the 1954 record by several million pounds. This yield was swelled by two additional months of plentiful pound net-caught menhaden and alewives.

<u>Soft Clams</u>: The soft clam industry, which is the Chesapeake's newest fishery, showed signs of bursting its bounds in the two Maryland counties to which it had been confined during the five years of its existence. Fishing intensity has been confined to a small operating area, and expansion to other counties and even into Virginia was sought.



Maine

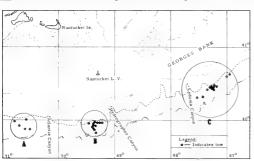
 $\underline{1955}$ CANNED SARDINE PACK: The 1955 Maine canned sardine pack amounted to 1,254,222 cases, according to official figures released by the State Department of Agriculture on January 18, 1956, reports the Maine Sardine Industry. The industry's Executive Secretary said that the pack was the smallest for any year since 1939 and that this was reflected in packers' inventories which were also near an all-time low for the month of January.

The 1956 Maine sardine canning season legally opens on April 15, but no sizable pack can be expected until late May if the trend of the past ten years continues.



North Atlantic Fisheries Exploration and Gear Research

<u>DEEP-WATER TRAWLING FOR LOBSTERS TRIED BY "DELAWARE" (Cruise</u>
<u>14</u>): More than 7,000 pounds of deep-water lobsters (Homarus americanus) were



Cruise 14 of the Service's exploratory fishing vessel Delaware.

brought aboard the Service's exploratory vessel Delaware during cruise 14, which was completed with the return of the vessel to East Boston on January 28, 1956. During the 13-day trip, exploratory trawling operations were conducted in three areas (marked A, B, and C on the chart) at the edge of the continental shelf, south and east of Georges Bank. In each area successive tows were made in depths between the 100- and 400-fathom range.

A standard No. 41 otter trawl, rigged without rollers, was used in areas "A" and "B." In area

"C" it was necessary to re-rig the net with rollers, because of the many bottom obstructions encountered.

Five tows were made in area "A," with poor results -- a catch of only 19 lobsters. The best single catch was made in the 240- to 260-fathom depth range.

The best fishing was encountered in area "B," where 13 tows were made. The greatest single catch of the cruise--132 lobsters--was made in this area in the 200-275 fathom depth range. The average was 65 lobsters (approximately 455 pounds) a tow.

Fishing results in area "C" were clouded by the many hang-ups encountered. A total of 178 lobsters was taken in 12 tows.

The average weight of the lobsters taken on this trip was approximately seven pounds each.

In cooperation with the Massachusetts Division of Marine Fisheries, a total of 415 lobsters was tagged and released where caught, In addition, 62 lobsters were tagged and released in shallow water in the Beverly area.

Of the total of 1,041 lobsters taken, 56.6 percent were females and 43.4 percent were males. Of the females 159 (or 15.2 percent) of the total catch were eggbearing.

Samples of quick-frozen cooked lobster meat were processed on board and stored ashore for consumer-acceptance and storage tests.

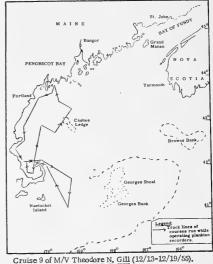
Production-type exploratory fishing for ocean perch in deep-water south of Sable Island will be the Delaware's mission on Cruise 15, scheduled to start at East Boston on February 6, 1956.

North Atlantic Herring Research

PLANKTON SURVEY OF GULF OF MAINE BY "THEODOREN. GILL" (Cruise 9): During the second and third weeks of December 1955, a second plankton survey was made in the Gulf of Maine by the U.S. Fish and Wildlife Service research vessel. Theodore N. Gill. Hardy Plankton Recorders were used on this cruise as on cruise 8. This work is being done in an effort to determine monthly the numbers distribution of the developing herring young, the product of the 1955 spawning.

Two of the recorders were towed over the track line shown on the chart at a speed of approximately 9 knots. One was towed at the surface and the other at the 10-meter depth. Plankton tows were also made at 8-hour intervals using a conical silk gauze meter net. Surface and subsurface temperature records were kept as on previous cruises.

This cruise was to cover the area from the upper part of the Bay of Fundy to 50 miles southeast of Nantucket Island. including Cashes Ledge, Browns Bank, and



the waters off southern Nova Scotia. However, after having been slowed considerably by unfavorable weather, the vessel returned to Boothbay Harbor with engine trouble on December 19. The work will be resumed when the vessel is again in seaworthy condition.



Pacific Oceanic Fishery Investigations

TAGGED BIG-EYED TUNA RECAPTURED BY THE JAPANESE: The first tagged big-eyed tuna ever recaptured in the Pacific was recently taken by Japanese fishermen, thus contributing to the knowledge of the growth and migration habits of this large tuna. According to the Director of the Pacific Oceanic Fishery Investigations, this fish, known locally as "mebachi shibi" or "ahi," was tagged and released by the U. S. Fish and Wildlife Service research vessel John R. Manning, on January 31, 1955, at a point 400 miles northeast of Midway Island.

The fish was retaken by a Japanese long-line fishing vessel, the No. 5 <u>Nikko Maru</u> of the Fukushima Prefecture on November 24, 1955, at a point 690 miles due north of Oahu. The tagged fish had been at liberty for a period of 10 months and moved at least 800 miles during the interval of its freedom. Measurements taken of the fish both at the time of release and at recapture showed that the fish had grown approximately 10 pounds.

This recovery is the first from a total of 82 big-eyed tuna tagged in North Pacific waters by the POFI research vessels between January and September 1955. Besides contributing to the study of the growth and migration of the big-eyed tuna, about which there is very little information to date, the recovery demonstrates the excellent cooperation between scientists and commercial fishermen, in this case between United States scientists and Japanese fishermen.



Fishery Products Market Outlook, January-March 1956

If the American housewife fails to find canned salmon on her grocer's shelves at any time during 1956, she will find plenty of fish sticks in the freezers, the January-March 1956 Commercial Fisheries Outlook (Fishery Leaflet 336aa) of the U.S. Fish and Wildlife Service points outs. Although the Maine sardine pack is the lowest it has been in 15 years, the canned tuna supply is ample. While cod and haddock fillets, halibut, swordfish, shrimp, salt herring, and some fresh-water fish supplies are well below the five-year average, there are plenty of flounder fillets, whiting, and spiny lobster tails.

All of this would indicate a generally steady market for most of the major fishery products with slight price increases for the items which are in short supply.

The salmon pack for 1955 was exceptionally small, both in the United States and Canada. As a result of this small pack canners report that already 95 percent of their 1955 output has gone into trade channels. The Alaskan salmon pack for 1955 was 2, 385,000 standard cases, 710,000 cases below the 1954 output. British Columbia canners produced 1,406,000 cases, or 304,000 cases less than in 1954.

Shrimp prices which advanced rather unexpectedly during the autumn months will continue high through Lent. Hurricanes interfered with shrimp fishing in the Gulf of Mexico during the fall months and catches were light. With the short supply,

many buyers apparently entered the market simultaneously with a resulting rise in prices. Some buyer resistance was noted late in December but since holdings will

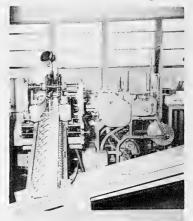
probably not increase this quarter, prices will continue at a high level. However, good catches on the west coast of Mexico may stabilize prices to a certain extent,

While the Maine sardine pack took a sharp drop during the year, the California sardine pack showed an increase but the strong export demand which is in evidence enhances marketing prospects for the California product.

Hurricanes also hit the oyster industry during the past two years and the supplies this season will be light. The market is strong and prices will be higher than they were a year ago.

Because of bad weather in the closing days of the 1955 halibut season in the Pacific, the catch was less than in 1954 by 13 million pounds. Storage holdings are down 5 million pounds. All of which indicates that there will be an increase in halibut prices.

America will experience its usual midwinter lull in fresh-water fish production, but imports from Canada are expected to follow their usual high midwinter pattern.



Packages of fish sticks coming off the labeling or overwrapping machine in a leading Boston fish stick plant.

Prices on cod, haddock, and ocean perch fillets will rise slightly and show some stability at the higher level.

But America's newest fish morsel, the fish stick, is stepping into a lot of gaps. Production for the first nine months of 1955 was up 45 percent above the like period in 1954. Supplies at present are ample and the prices are competitive.



Saltonstall-Kennedy Act Fisheries Projects

ACTIVITIES OF THE FIRST YEAR (FISCAL YEAR 1955): Nearly half of the \$3,000,000 provided the Fish and Wildlife Service by the Saltonstall-Kennedy Act for the year ending June 30, 1955, was used for biological research on fish and fisheries, according to a report issued by the Secretary of the Interior on December 30. The report is titled: "Research and Activities under the Saltonstall-Kennedy Act, Fiscal Year 1955 (Annual Report of the Secretary of the Interior)." A total of \$1,434,000 was expended on these studies. Approximately the same amount (\$1,444,000) was spent for research in the exploration, development, and utilization of our fishery resources. About \$92,000 was allotted to general administrative expenses and \$30,000 to construction.

The Saltonstall-Kennedy Act was passed in 1954, amending existing statutes. It provides funds "to promote the free flow of domestically produced fishery products in commerce by conducting a fishery educational service and fishery technological, biological and related programs—and to develop increased markets for fishery products of domestic origin...."

In carrying out this policy, the Department has let about 60 contracts for research work in every section of the country for over 40 percent of the year's funds. The contractors include 30 universities, colleges, and public institutions, and 13 commercial and independent scientific research organizations. These contracts represent in excess of \$1,250,000.

More than 100 projects, representing a potential expenditure of more than \$10,000,000 have been suggested for study under the Saltonstall-Kennedy funds. An advisory committee named by the Secretary of the Interior advises in preparing rules and regulations and in recommending priority of projects.

The biological studies covered a variety of subjects including:

Salmon and related species, \$216,700 to determine the racial characteristics of salmon, develop methods of counting, and to secure escapement data.

Pacific sardine, \$114,500, to determine why the supply of sardine, anchovy, and mackerel on the Pacific Coast fluctuates to such a degree.

North Atlantic trawl fishes, \$401,600 to secure biological data on sea scallops, whitings, flounders and ocean perch; to continue operation of the research vessel Albatross III and to study the ocean environment of the offshore banks.

Herring, \$71,900, studies on the biology of herring.

Gulf of Mexico fishes, \$149,300, research on shrimp, sponges, and redtide.

High seas research, \$50,000, on stocks of king crab of the Bering Sea and North Pacific Ocean.

Tuna research in the Pacific. \$216.500.

Commercial shellfishery research, \$145,600 of which \$85,000 was on New England oysters, \$39,000 on Middle Atlantic oysters, and \$21,600 on oysters in the Gulf of Mexico. Menhaden research required \$30,000, and \$23,100 went to improve cultural methods for channel catfish.

The report shows that \$1,385,000 has been allocated for most of these studies in the fiscal year ending June 30, 1956, but in varying amounts. New studies include investigation on Alaska salmon predators and effects of logging for which \$108,300 has been allotted and another allocation of \$32,000 for Atlantic striped bass studies. There will be no expenditure on king crab or sponges from Saltonstall-Kennedy funds in 1956.

A total of \$351,500 was spent on exploratory fishing and gear research. For the current fiscal year ending June 30, 1956, \$299,000 has been allotted for these studies. Maine sardine explorations in the past year cost \$71,000; North Atlantic explorations cost \$163,400. Both of these projects are being continued and about the same amounts have been allocated.

There was \$78,000 spent on construction of a gear research vessel in the past year. Overhauling of the electrical system and the purchase of a radar set for the $\underline{\text{Oregon}}$ in the Gulf explorations was a \$39,000 expense which will not be repeated in fiscal 1956, but \$60,000 has been allocated for South Atlantic shrimp explorations in fiscal 1956 as contrasted with no expenditures for the past year.

Fish technological studies accounted for an expenditure of \$424,000 in the year ending June 30, 1955, and \$464,000 has been allocated for the present fiscal year ending June 30, 1956. The 1955 expenditures include \$139,000 for the development

of voluntary fishery products standards; \$40,000 for research on handling, freezing, and packaging southern oysters; \$65,000 to develop an index for the nutritive value of fish meal; \$170,000 to develop new uses for fish oil; and \$10,000 on freezing skipjack tuna at sea. All of these programs have been extended into 1956.

Market development and fishery education spent \$304,300 in fiscal year 1955 and will have \$315,000 in fiscal 1956. The regular education and market development program cost \$167,000. The expanded program cost \$137,300. This included expanded school-lunch activities, locker-plant studies, and special marketing programs.

With the approval of the legislation on the first day of the fiscal year (July 1, 1954) in which it became effective, it was incumbent upon the Department of the Interior to implement the purposes of the Act without delay. This was possible because the American fishing industry had in the past made its needs well-known to the Department and the Fish and Wildlife Service. In addition, there was a wealth of background material on the needs and wishes of the domestic industry resulting from the hearings held by the Senate Subcommittee of the Committee on Interstate and Foreign Commerce on April 1, 1954. As a result, the Service was able to develop and the Department to announce a program on September 10, 1954, calling for the expenditure of approximately \$1,800,000 of the funds available in the first year under the Act,

The Secretary of the Interior was authorized under the Act to appoint an advisory committee of the American fishing industry to advise him in the formulation of policy, rules, and regulations pertaining to requests for assistance, and other matters.

Because of the loss of time necessarily taken up with administrative details in connection with the appointment of the Advisory Committee members, the first year's program was largely developed without the advice of the Committee. However, when the Committee met on April 28 and 29, 1955, there was still unallocated and unexpended a total of about \$700,000. The Committee endorsed the program and activities already under way, and made recommendations for the expenditure of the remaining \$700,000.

Note: See Commercial Fisheries Review, October 1955, pp. 69-70.

* * * * *

FISHERY STATISTICAL OFFICE OPENED IN BROWNSVILLE, TEX., AND KEY WEST, FLA.: Statistical offices for the collection of fishery data have been opened at Brownsville, Tex., and Key West, Fla., by the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service. These offices will collect detailed data on employment in the fisheries, number of craft and quantity of gear operated, the catch of fishery products, and related information on the fisheries in the vicinity of Brownsville and Key West. Detailed statistics on the shrimp fishery will be obtained in connection with the Service's expanded program for the collection of shrimp statistics. James H. Ryan will be in charge of the Key West office. These new offices are being financed by funds provided by the Saltonstall-Kennedy Act (68th Stat. 376).

The information on shrimp production will be released in the daily <u>Fishery Products Report</u> published by the Service in New Orleans and in the monthly bulletins entitled <u>Shrimp Landings</u> published by the Service in Washington, D. C. Copies of the <u>Fishery Products Report</u> may be obtained from the Fish and Wildlife Service, Federal Building, New Orleans 12, Louisiana; and of <u>Shrimp Landings</u> from the Statistical Section, Branch of Commercial Fisheries, Fish and Wildlife Service, Washington 25, D. C. The first issue of <u>Shrimp Landings</u> will coverlandings during January 1956.

School-Lunch Program

FISH-COOKERY DEMONSTRATION PROGRAM FOR 1956: An estimated 200 fish-cookery demonstrations, most of them for school-lunch groups, will be given by the Fish and Wildlife Service during 1956, Acting Secretary of the Interior Clarence A. Davis said December 27, 1955. At present 180 demonstrations have been

scheduled or are in the process of being

scheduled.



Sampling the fish dishes prepared at the fish-cookery demonstration at the Santa Rita Elementary School in San Angelo, Tex., January 23, 1956,

The fish-cookery demonstrations are part of the broader program of the Fish and Wildlife Service in the development of wider markets for fish and shell-fish. Currently the work is being done under responsibility established by the Saltonstall-Kennedy Act. The activity is financed by funds made available by the same Act. Recipes developed intest kitchens at College Park, Md., and Seattle, Wash., are used in the demonstrations.

The Fish and Wildlife Service has given approximately 1,300 fish-cookery demonstrations since 1946. Of these 1.000 have been for school-lunch groups and 300 for educational, institutional, and homemaker groups. School-lunch demonstrations for the most part are given to those actually responsible for the preparation of school lunches. This is true also of the institutional classes. The homemaker and educational demonstrations are given for persons who teach others, such as college home-economic classes, extension workers, and gas and electric cooking-school personnel. One fish-cookery demonstration given to a

cooking-specialist class by the Fish and Wildlife Service was passed along to 16,000 individual homemakers during the following year.

Until recently most of the work has been done in the eastern half of the United States. In many of the more sparsely-settled states demonstrations have been arranged for summer "workshops" or short courses for school-lunch personnel.

In 1956 the project will be expanded to provide for a nationwide program. In some of the states in which demonstrations were given five or more years ago, additional series are now being scheduled to train persons who have entered the school-lunch program recently.

To date, the following demonstrations have been scheduled, with others to follow: Texas 50 demonstrations; California 48; Maryland 10; Missouri 12; Wisconsin 12; Virginia 25; and South Carolina 23.



South Atlantic Exploratory Fishery Program

NEW GEAR RESEARCH VESSEL COMMISSIONED: A new gear research and exploratory fishing vessel, the George M. Bowers, was commissioned January 7

in Miami, Fla., by the U.S. Fish and Wildlife Service. This addition to the Service's fleet of exploratory fishing vessels has a wooden hull and is 73 feet long. It was built with funds provided by the Saltonstall-Kennedy Act of 1954 which was designed to promote fishery technological, biological, and market studies. It was constructed for the U.S. Fish and Wildlife Service by the Tampa Steamways, and will be based in Miami.



Fig. 1 - The George M. Bowers, a new gear research and exploratory fishing vessel recently commissioned by the U. S. Fish and Wildlife Service.

The $\underline{\text{George}}\ \underline{M}$. $\underline{\text{Bowers}}$ is especially equipped for research work on fishing gear and will be primarily a gear-research vessel but can be used for deep-sea explora-



Fig. 2 - U, S, Fish and Wildlife Service Director John L, Farley, principal speaker at the commissioning čeremony of the George M, Bowers,

a brief biographical sketch of his father. The new vessel will be under the command of Captain A. M. Morgan.

tion also. The wooden hull was chosen because a wooden vessel is better suited to the electronic equipment which will be used in the research program. Among other things, the vessel has underwater television equipment which will permit close study of fishing gear operation under water, the effect of gear on any fish habitat on the bottom, escapement through the nets, and numerous other technical questions that have concerned our commercial fisheries for years.

The Director of the Service accepted the vessel for the U. S. Fish and Wildlife Service. The vessel is named after George M. Bowers, Commissioner of Fisheries, from 1898 to 1913. His son, George M. Bowers, Jr., gave

For an indefinite period the <u>George M. Bowers</u> will work close to Miami because the extremely clear water there makes it well adaptable to the type of research to be pursued. Its immediate objective will be to assist in shrimp exploration on the southeast Atlantic Coast, a project also financed by Saltonstall-Kennedy funds.



Sport Fishing and Hunting Economic Survey Under Way

The Nation's first survey to determine the importance of hunting and fishing in our economy was begun about January 3, 1956. The survey is being conducted by

Crossley S-D Surveys, Inc., under a contract signed on June 1, 1955, with the U.S. Fish and Wildlife Service.

About 15,000 households, some in every state of the Nation, will be visited initially and interviews will be conducted with hunters and fishermen in about 5,000 of these. The survey is designed to show how much time and money was spent on hunting and fishing activities last year. Americans have long been aware of the intangible values and the national re-



A sport fisherman's catch,

laxation afforded by hunting and fishing and will now see the economic side of the picture.

With our increasing population gradually squeezing hunting and fishing resources and with that same increasing population demanding more fish and more game, America is facing a real challenge. One of the logical steps to meet this challenge is the present survey.

In September of 1954, the U. S. Fish and Wildlife Service was requested to make this survey, the request coming from the International Association of Game, Fish and Conservation Commissioners, representing the fish and game departments in the 48 states. Several of the states have also contracted with the survey firm to conduct similar studies.



Public Eating Places Survey

NUMBER SERVING FISH AND SHELLFISH: Public eating places are still a fertile field for exploration by those who deal in fish and shellfish, a survey being conducted by the U. S. Fish and Wildlife Service indicates. Projecting the preliminary results of a probability sampling of 4,500 public eating places for one phase

Table 1 - Number of Public Eating Places in the United States Reporting Whether or Not Fishery Products Are Served, By Type Those Serving No Those Serving Fish Type Total Fish or Shellfish or Shellfish Percent Number Percent Number Number Restaurants 20,703 16.8 102, 407 83.2 123, 110 Cafeterias 4, 181 4,824 643 13.3 86.7 Restaurants or cafeterias located in hotels 15,518 1,246 14, 272 8.0 92.0 Drug or proprietary stores with fountain 33,771 25, 260 74.8 8,511 25.2 Other (drinking places, caterers, lunch counters, and refreshment stands) . . 206, 268 134, 171 65.0 72,097 35.0 383, 491 47.5 201, 468 52.5

of the study, only half of the various types of public eating places in the United States served fish or shellfish in 1955.

The survey made by the Service to find out about fish consumption in public eating places indicates that while more than 100,000 restaurants and cafeterias in this country did serve fish or shellfish in 1955, there were more than 20,000 which did not. A high percentage of the drug stores having soda fountains (25,260 out of the

Table 2 - Type of Public Eating Places Serving No Fishery Products, by Region									
Type	Total		heast		Central		uth		est
	Number	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Restaurants	20,703	2,014	4.7	6,040	10.0	7,959	15.0	4,690	18.4
Cafeterias	643	-	-	72	. 1	499	.9	72	. 3
Restaurants or cafeterias									
located in hotels	1,246	938	2.2	133	. 2	175	.3	-	-
Drug or proprietary stores									
with fountain	25,260	6,497	15.2	10,086	16.7	6,688	12.6	1,989	7.8
Other (drinking places,			1				1		
caterers, lunch counters,									
and refreshment stands).	134, 171	33,350	77.9	44,234	73.0	37, 849	71.2	18,738	73.5
Total	182,023	42,799	100.0	60,565	100.0	53, 170	100.0	25, 489	100.0
Note: Same as table 1,									

33,771 in the country) did not serve fish during the year. Under the "other" classification (includes various drinking places which serve food, catering establishments, lunch counters, and refreshment stands) there were 134,000 out of 206,000 (or 65 percent) which did not serve fishery products of any description during the past year.

The West and the South accounted for many of the restaurants which did not serve fishery products last year, but the miscellaneous eating places not serving fish seemed to be distributed fairly evenly around the Nation.

Table 3 - Number of Portions for Each Pound of Fish Fillets Served by Each Type of Public Eating Place Using Fishery Products												
						Type	of Public	Eating Pl	aces			
Number of Servings	То		Resta			Restaurant or Caf- eterias in Hotels		Drug or Proprie- tary Stores		Other		
	Number	Percent		Percent	Number	Percent	Number		Number	Percent	Number	
One serving	2,609	1.3	1,833	1,8	-	-	323	2.3	(a)	(b)	429	(b)
Two servings	33, 353	16.6	19,555	19.1	593	14.2	4,500	31.5	-	-	8,705	12,1
Three servings .	60, 365	30.0	37,647	36.8	1,213	29.0	4,675	32.8	1,287	15.1	15,543	21.6
Four servings	31, 304	15.5	18,014	17.6	1,327	31.7	1,438	10.1	1,896	22.3	8,629	12.0
Five servings	3,580	1.8	1,868	1.8	143	3.4	72	(b)	250	2.9	1,247	1.7
Six servings	1,356	(b)	428	(b)	-	-	-	-	-	-	928	1.3
Seven servings .	72	(b)	72	(b)	-	-	-	-	- 1	-	-	-
Eight servings .	245	(b)	72	(b)	(a)	(b)		-	-	-	143	(b)
No reply or not												
applicable	68,591	34.0	22,918	22.4	876	20.9	3,264	22,9	5,056	59.4	36,477	50.6
Public eating places												
serving fishery												
products in U. S.		100.0	102,407		4, 182		14,272	100.0	8,513	100.0	72,101	100.0
(a) Less than 50 establishment	is. (b)	Less than or	e percent,	Note: 5	Same as table	1.						

The survey included approximately 4,500 establishments and covered a one-week period in May 1955. The Service contracted with the Bureau of the Census to conduct the survey.

Table 1 is a preliminary report on the distribution of establishments in the United States which reported whether they did or did not serve fish or shellfish products. Table 2 shows the average number of public eating places serving no fish or shellfish by type and by regions.

<u>PORTION CONTROL FOR FISH FILLETS:</u> A standard portion of fish or shell-fish, individually wrapped in cellophane at a carefully inspected processing plant and placed before him virtually "untouched by human hands," may be in the offing for the patron of public eating places. One of the questions included in the U. S. Fish and Wildlife Service survey of 4,500 public eating places was designed to determine "how much fish is a portion," which in turn may be the basis for some major changes in the processing of fishery products for restaurant use.

This study is of particular interest to restaurants and other public eating places because of the increasing demand for fishery products in those establishments and because restaurants seem to be incurring losses in time and product waste because of "guess-cutting" by kitchen help who in many cases have not had the training to become adept in the particular job of determining the individual serving portion for fishery products.

Table 4 - Number of Portions for Each Pound of Fish Fillets Served by Public Eating Places Using Fishery Products According to Volume of Sales												
Number of		Volume of Sales										
	-		\$100.	000	\$40.0	000 to	\$10.0	000 to	Les	s Than	No R	
Servings	То	tai	or M	ore	\$99	,000	\$39	,000	\$1	0,000	140 L	epty
			Number	Percent		Percent	Number	Percent	Number	Percent	Number	Percent
One serving , , .	2,609	1.3	556	3.8	684	2.8	642	1.1	572	(b)	155	1.2
Two servings	33, 353	16.6	4,080	27.6	5,183	21,6	9,502	15.7	11,762	13,3	2,826	21,1
Three servings, .	60, 365	30.0	5,780	39.1	7,925	33.0	22, 133	36.5	21,529	24.3	2,998	22.4
Four servings	31,304	15,5	2,369	16.0	5,252	21,8	10,161	16,8	10,768	12.1	2,754	20.6
Five servings	3,580	1.8	77	(b)	364	1.5	1,175	1.9	1,750	2.0	214	1.6
Six servings	1,356	(b)	72	(b)	214	(b)	214	(b)	856	1.0	-	-
Seven servings .	72	(b)	-	~	~	-	72	(b)	-	-	-	-
Eight servings	245	(b)	87	(b)	(a)	(b)	-	-	-	-	143	1.1
No reply or not												1
applicable	68,591	34.0	1,770	12.0	4,400	18.3	16,678	27.5	41,446	46.7	4, 297	32.0
Public eating places												
serving fishery							i					
products in U. S.	201, 475	100.0	14,791	100.0	24,037	100.0	60,577	100.0	88,683	100,0	13,387	100.0
(a) Less than 50 establishmen	nts, (t	b) Less than or	ne percent,	Note	: Same as tab	le 1.						

There is a wide variance as to what constitutes a "portion" of fish fillets in restaurants and other public eating places, according to the preliminary results of this survey. The most popular serving of fish fillets is about five ounces per person, or about three servings to a pound of fillets. A very few of the restaurants indicate that they serve a pound of fillets per person. Then there are others who state that they serve six portions to a pound. Approximately one-third of them serve three. Another one-third is about equally divided between serving two or four portions from a pound of fillets. Projecting the results of the probability sampling of 4,500 public eating places, we found that over 60 percent of the public eating places in the United States serve between 2 to 4 portions from a pound of fish fillets.

U. S. Fish Stick Production

The fish stick--that recent addition to America's diet--has found a friend in the young American housewife and is proving to be an economic asset to several areas in the Nation, especially in New Eng-

land, according to U. S. Fish and Wildlife Service reports.

1955 PRODUCTION: Data compiled by the Service show that the production of fish sticks in 1955 exceeded 65 million pounds, compared with almost 50 million pounds in 1954, and 7.5 million pounds in 1953 (table 1). In 1952 the only production was in pilot plants engaged in getting this new industry started. Production is still centered in New England (which accounts for about 40 million pounds of the total), but the industry has spread to many states on the eastern and western seaboards and even into the Midwest.

During 1955, 88 percent of the production was made up of cooked fish sticks and the remaining 12 percent was uncooked.

Table 1 - U.S. I	Productio	n of Fish
Sticks, 1954-	55, by M	onths
Month	19552/	19541/
	(Million	of Lbs.)
January	5.1	2.8
February	5.8	3.2
March	7.2	4.0
April	6.2	3.8
May	5.1	3.9
June	5.7	4.4
July	4.6	3.8
August	4.7	4.4
September	5.6	4.3
October	5.4	5.6
November	5.0	4.8
December	5.0	5.0
Total	65.4	50.0
1/ Revised.	2/ Preli	minary.

OCTOBER-DECEMBER 1955: During the fourth quarter of 1955, the United States production of fish sticks amounted to 15.4 million pounds. This was slightly

Table 2 - U. S. Production of Fish Sticks,								
October-December 1955								
Month	Cooked	Uncooked	Total					
	(Million of Pounds)							
October	4.6	0.8	5.4					
November	4.3	0.7	5.0					
December	4.3	0.6	4.9					
Total 4th quarter 1955 .	13.2	2.1	15.3					
Total 4th quarter 1954 .	12.8	2.5	15.3					
Total 12 months 1955 .	57.6	7.8	65.4					
Total 12 months 1954 .	43.6	6.4	50.0					

less than the production reported for the corresponding quarter of 1954 (table 2).

YOUNG HOUSEWIVES
PREFER FISH STICKS: A
consumer survey completed
by the U. S. Fish and Wildlife Service indicates that it
is the young American housewife, the homemaker under
25 years of age, who favors
the fish stick. The survey

also showed that the white-collar worker was more inclined to purchase them than was the manual worker, and that only 20 percent of the families with annual incomes of less than \$2,000 were fish-stick purchasers, compared with 50 percent of the families with incomes of \$10,000 a year or more.

The production figures for 1955 seemed to indicate a leveling off during the year at slightly less than 6 million pounds a month, but the consumer survey points out that 60 percent of the potential fish-stick market is still untouched. Also, the study emphasizes that 85 percent of the housewives who try fish sticks are satisfied with them.

Note: Also see Commercial Fisheries Review, October 1955, 1, 40; June 1955, p, 61; March 1955, p, 28.



U. S. Foreign Trade

IMPORTS OF GROUNDFISH FILLETS, 1955: United States imports of groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets in 1955 amounted

to almost 129.0 million pounds--6.3 percent less than in 1954 but still 40.8 percent more than in 1953.

Canada again led as the largest foreign supplier of groundfish fillets in 1955, shipping 74.7 percent of the total, while in 1954 it shipped 63 percent of the total imports. Iceland was the second largest supplier, but while in 1954 it shipped 27 percent of the total United States imports, in 1955 it supplied only 15.4 percent. Norway, the United Kingdom, Denmark, West Germany, Miquelon and St. Pierre, and France all shipped less fillets to the United States in 1955 than in 1954. On the other hand, Greenland shipped more fillets to the United States in 1955 than in 1954.

United States Imports of Groundfish (Including Ocean Perch) Fillets, 1953-55						
Country	<u>2</u> / ₁₉₅₅	1954	1953			
	(1,	000 Pound	s)			
Canada	96,359	85,632	59,673			
Iceland	19,875	39,269	25, 410			
Sweden	-	-	-			
Norway	4,220	4,615	3,956			
Denmark	3,926	2,735	256			
United Kingdom	50	173	139			
Netherlands	764	389	271			
France	313	354	232			
West Germany	2,426	3,641	1,532			
Japan	1	-	-			
Miquelon and						
St. Pierre	299	612	148			
Greenland	765	204	-			
Total 128,999 137,624 91,617						
1/ Includes blocks and slabs, the raw material for fish sticks.						
2/ Preliminary.						

Imports of groundfish fillets permitted to enter the United States at the $1\frac{7}{8}$ -cents-per-pound rate of duty in the calendar year of 1955 were 35, 432, 624 pounds,

compared with 33,950,386 pounds in 1954. Imports in excess of the quota enter at a duty of $2\frac{1}{2}$ cents per pound.

* * * * *

GROUNDFISH FILLET IMPORTS LOWER IN DECEMBER 1955: Imports of groundfish fillets, including ocean perch fillets, during December 1955 amounted

to 4.2 million pounds (see chart 7 in this issue). Compared with the 5.7 million pounds of these fillets reported for the corresponding month of 1954, this was a decline of 27 percent. The decline was caused primarily by substantially lower imports from Iceland. Canada also exported less fillets to the United States during December. West Germany and the United Kingdom exported no groundfish fillets to the United States during December 1954 but did export some fillets during the corresponding month of 1955. Denmark and the Netherlands both exported more fillets to the United States during December 1955 than during the same month of the previous year.



Unloading a refrigerated trailer loaded with imported frozen fillets at Fulton Market, Chicago, Ill.

Canada led all other countries exporting groundfish fillets to the United States with 3.9 million pounds during December 1955--12 percent less than during the same month of 1954. Canada accounted for 92 percent of the total groundfish fillet imports for December 1955.

* * * *

EDIBLE FISHERY PRODUCTS, OCTOBER 1955: United States imports of fresh, frozen, and processed edible fish and shellfish in October 1955 amounted

United Stat Products								
		Quantity			Value			
Item	00	t.	Year	00	t.	Year		
	1955	1954	1954	1955	1954	1954		
Imports: Fish & shellfish: fresh, frozen & processed 1/	(Mi 74.3	llions o	of Lbs.)		illions 17.1	of \$) 202.8		
Exports: Fish & shellfish: processed 1/ only (excluding fresh and frozen)			50.8		2,3	13,2		
1/Includes pastes, other specialtie		es, clai	n chow	der and	d juice,	and		

and shemish in October 1955 amounted to 74.3 million pounds (valued at \$5.7 million), according to a U. S. Department of Commerce summary (see table). This was an increase of 27.7 percent in quantity and 12.8 percent in value as compared with September 1955. Compared with a year earlier, October 1955 imports were higher by 9.7 percent in quantity and 7.6 percent in value.

Exports of processed edible fish and shellfish in October totaled 5.7 million pounds (valued at \$6.8 million), an increase of 39.0 percent in quantity and 6.3 percent in value as compared with September 1955. October 1955 exports were lower by 16.2 percent in quantity and 30.4 percent in value as compared with October 1954 exports.

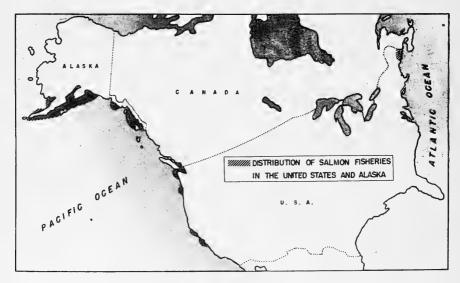


United States and Alaska Salmon Catch and Pack, 1955

<u>CATCH</u>: The catch of salmon in the United States and Alaska declined sharply in 1955, amounting to about 286 million pounds, as compared with 325 million pounds the previous year, preliminary data indicate. Reduced catches of red (sockeye) salmon on Puget Sound and chum salmon in Alaska were responsible for the decline.

Table 1 - U. S. & Alaska Salmon Catch by Species and Area, 1954-55 ¹								
		1955			1954			
Species	Alaska	Wash., Ore., & Calif.	Total	Alaska	Wash., Ore., & Calif.	Total		
(1,000 Lbs.)(1,000 Lbs.)								
Chinook .	11,128	26,771	37,899	12,208	24, 207	36,415		
Chum	27,950	6,116	34,066	67,084	9,149	76,233		
Pink	96,493	31,911	128, 404	88,692	2	88,694		
Red	49,250	6,115	55, 365	56,468	35,269	91,737		
Silver	16,146	13,938	30,084	22,581	8,846	31,427		
Total	200,967	84,851	285, 818	247,033	77,473	324,506		
1/ Preliminary of	lata.							

Pink salmon was the only species showing an important increase in catch. Largely because of the catch of nearly 32 million pounds of pink salmon on Puget Sound, the landings of pinks amounted to 128 million pounds as compared with 89 million pounds in 1954.



CANNED PACK: The estimated pack of canned salmon in 1955 amounted to 3,224,500 cases as compared with 4,163,100 cases for the previous year. The 1955 pack was only 36 percent as large as the record 1936 production of 8,965,000 cases and was the smallest since 1906.

Table 2	Table 2 - U. S. & Alaska Canned Salmon Pack by Species and Area, 1954-55 1/2							
		1955		1954				
Species	Alaska	Wash., Ore., & Calif.	Total	Alaska	Wash., Ore., & Calif.	Total		
	. (Std. Ca	ses48 1-lb.	Cans) .	. (Std. Ca	ses48 1-lb.	Cans) .		
Chinook .	47,000	30,500	177,500	51,373	78,560	129,933		
Chum	365,000	69,000	434,000	1,006,951	322,805	1,329,756		
Pink	1,244,000	415,000	1,659,000	1,136,792	14, 334	1, 151, 126		
Red	620,000	128,000	748,000	732,338	591,492	1, 323, 830		
Silver	109,000	84,000	193,000	167,299	47,824	215, 123		
Steelhead	-	13,000	13,000	-	13,379	13, 379		
Total	2,385,000	839,500	3, 224, 500	3,094,753	1,068,394	4, 163, 147		
1/ Preliminary	1/ Preliminary data,							



Wholesale Prices, December 1955

Some cold and wintry weather both along the East and West Coasts and in the Gulf of Mexico plus the usual light landings during the Christmas holidays curtailed the supply of fishery products during December 1955. The rise in the December 1955 index (112.6 percent of the 1947-49 average) for all edible fish and shellfish

(fresh, frozen, and canned) was slight when compared with November 1955, but 12 percent above December 1954.

The drop in the December 1955 index for the drawn, dressed, and whole finfish subgroup was due principally to better supplies of fresh whitefish and yellow pike. Prices for fresh large drawn haddock were almost unchanged, but prices of frozen dressed halibut increased slightly. From November 1955 to December 1955 this subgroup index dropped 2.1 percent, but was 8.9 percent higher than the index for December 1954.

Prices were substantially higher in December 1955 than in the previous month for fresh skin-on haddock fillets (up 8.3 percent) and fresh headless 26-30 count shrimp at New York City (up 12.8 percent)



A 34-pound lobster caught off Montauk Point, L. I., on display at the fish section of a chain food store in Niantic. Conn.

because supplies were fairly light. For the fresh processed fish and shellfish subgroup, the index in December 1955 was 6.0 percent higher than the previous month and 22.5 percent above the index for the same month in 1954.

Higher prices for fresh shrimp were reflected in a rise in the prices for frozen packaged shrimp. Prices at Chicago for frozen headless 26-30 count shrimp continued to increase from November to December 1955, but at a slower rate in spite of the 32-percent increase from October to November 1955. The December 1955 index for the processed frozen fish and shellfish subgroup was up 3.6 percent from November and 27.5 percent above December 1954.

In the canned fishery products subgroup, canned Maine sardine prices rose in December 1955 because the pack for the 1955 season was the smallest in 15 years; canned light-meat chunk tuna prices were readjusted downward to reflect changes in marketing conditions; canned California sardine prices dropped because the pack

Table 1 - Wholesale Average Prices and Indexes for	or Edible Fish	and S	Shellfis	h, Decemb	er 1955	With Co	omparis	sons
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. 1	Prices <u>1</u> /			exes 49=100)	
			Dec. 1955	Nov. 1955	Dec. 1955	Nov. 1955	Oct. 1955	Dec. 1954
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)	·	·			112.6	112,0	107.4	100.5
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibur, West., 20/80 lbs., drsd., fresh or froz. Salmon, king. Ige. & med., drsd., fresh or froz. Whitefish, L. Superior, drawn, fresh Whitefish, L. Erie pound or gill net, rnd., fresh Lake trout, domestic, No. 1, drawn, fresh Yellow pike, L. Michigan & Huron, rnd., fresh	Boston New York New York Chicago New York Chicago New York	lb. lb. lb. lb. lb. lb.	.12 .28 .59 .53 .68 .65 .44		121.0 117.0 124.3 85.1 133.1 131.4 136.5 132.2 102.0	118,5 119,3 125,7 84,6 133,7 185,9 171,9 132,2 102,0	110,1 115,6 106,3 99,3 135,1 161,1 161,7 116,8 75,1	102,9 107,4 97,3 87,7 129,2 109,1 114,2 129,1 90,3
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb, tins Shrimp, Ige, (26-30 count), headless, fresh Oysters, shucked, standards	Boston New York Norfolk	lb. lb. gal.	.39 .72 5.50	.36 .64 5.50	132.7 113.4 136.1	122.5 100.5 136.1	102.1 87.1 136.1	91,9 84,2 123,7
Processed, Frozen (Fish & Shellfish):					113,7	109,7	93.3	89,2
Fillets: Flounder (yellowtail), skinless, 1-lb, pkg, Haddock, sml,,skins on, 1-lb, pkg, Ocean perch, skins on, 1-lb, pkg, Shrimp, Ige, (26-30 count), 5-lb, pkg,	Boston Boston Boston Chicago	lb. lb. lb. lb.	.40 .29 .28	.40 .29 .27 .71	104.7 89.5 112.8 116.5	104.7 89.5 108.8 110.0	102.1 84.7 106.7 83.3	98.2 90.2 111.8 72.5
Canned Fishery Products:					100.5	102.6	103.4	96,8
Salmon, pink, No.1 tall (16 oz.), 48 can/cs, Tuna, It, meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack,No. 1 oval (15 oz.), 48 cans/cs. Sardines,Maine, keyless oil, No. 1/4 drawn	Seattle Los Angeles Los Angeles	case	7.00	12.60 7.38	114.8 85.1 81.7	90.8 86.1	92.3 88.1	104.4 93.0 <u>2/</u>
(3-1/4 oz.), 100 cans/cs	New York	case	8,70	8,20	92,6	87,3	87.3	71,3

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs,

These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices,
2/Not avaiable,

was better than early season predictions had indicated; and canned salmon prices remained unchanged although stocks were practically exhausted. This subgroup index dropped 2 percent from November to December 1955, but was still 3.8 percent higher than a year earlier.





International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1956: No changes in the 1956 North Pacific halibut fishery regulations which would alter either the amount or the disposition of fishing during 1956 is the recommendation of the International Pacific Halibut Commission after its annual meeting in Seattle during the latter part of January.

The Commission, whose treaty function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, bases its decisions regarding regulation upon the findings of its scientific staff. It reviewed at length the scientific evidence submitted during the sessions, as well as the recommendations of the entire Pacific Coast industry. Due to the abnormal fishing conditions that prevailed during the 1955 season, the scientific investigations had not provided the necessary confirmation of the effects of the multiple seasons inaugurated in 1954. Consequently, the Commission decided against any change in 1956, a January 27 news release from the Commission points out.

A large section of the industry proposed a further splitting of the seasons. After most thorough study, the Commission was of the opinion that the need for such a change at this time had not been established by investigations, as is specifically required by the 1953 convention. Accordingly the Commission decided against providing any additional seasons in 1956.

The Commission is recommending to the United States and Canada the following fishing regulations for the 1956 season.

- (1) The fishing areas shall be the same as in 1955.
- (2) There shall be no change in the catch limit of 26.5 million pounds for the first season in Area 2.
- (3) There shall be no change in the 28-million-pound catch limit for the first season in Area 3A.
- (4) The opening date for the first halibut fishing season in all areas shall be May 12.
- (5) In addition to the above seasons, based upon attainment of catch limits, further fishing seasons shall be allowed as follows:
 - (a) Areas 2 and 1B shall be reopened on August 10 for a period of at least seven days.
 - (b) Areas 3A and 3B shall be reopened on August 10 for a period of at least nine days.

- (c) In the event there is a significant deficiency in the catch limit taken during the first season in Area 2 or Area 3A, the Commission may increase the length of the aforesaid 7- and 9-day second seasons by announcement prior to their second opening.
- (d) Area 3B, which includes the grounds west of Shumagin Islands and in Bering Sea, will be opened for a third fishing season 12 days after the end of the second season in that area for a period of 23 days. Area 1A, which opens on May 12, shall close with the final closure of Area 3B.

The Commission provided that there would be at least 14 days between the closure of the first season and the commencement of the second season in Area 3A. All openings and closures shall take place at 6:00 a.m. Pacific standard time.

The Commission during its sessions met with the scientific staff, with representatives of the vessel owners, dealers and fishermen's organizations of the Pacific Coast, and with a newly-established nine-man Industry Advisory Group.

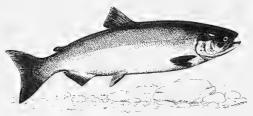
The Commission is responsible to Canada and the United States for the investigation and regulation of the North Pacific halibut fishery, which now produces nearly 75 percent of the world's halibut catch. When regulations began 24 years ago, the Pacific Coast catch totaled only 44 million pounds and required a 9-month season to make the catch. Under the Commission's management there has been a progressive improvement of the stocks. The annual catch during the past two years has averaged over 65 million pounds, and it has been caught in only $2\frac{1}{2}$ months of fishing.

Seton H. Thompson of the U. S. Fish and Wildlife Service was elected Chairman, and S. V. Ozere of the Department of Fisheries of Canada, Vice-Chairman for 1956. Other members of the Commission are Harold Helland and Richard Nelson, representing Canada, and Mattias Madsen and J. W. Mendenhall, representing the United States.

Note: Also see Commercial Fisheries Review, February 1955, p. 44.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

SOCKEYE SALMON REGULATIONS FOR 1956: Recommendations for regulatory control of sockeye salmon fishing during 1956 in Convention waters have been



Sockeye (red) salmon (Oncorhyncus nerka)

officially approved by the International Pacific Salmon Fisheries Commission and have been submitted to the governments concerned.

The approved reduction in fishing area in both United States and Canadian Convention waters is considered necessary to provide adequate racial escapements from the relatively small sockeye salmon runs expected in 1956.

Recommendations for Regulatory Control of Sockeye Fishing in Convention Waters as Approved by the International Pacific Salmon Fisheries Commission in Official Session January 21, 1956, in Seattle, Wash.

<u>United States Convention Waters lying easterly and inside of the Bonilla Point-Tatoosh Island Line.</u>

 That there shall be a weekly closure of 72 hours duration including Friday, Saturday and Sunday of each week in all United States Convention waters from June 28 to August 13; provided that the waters of the Strait of Juan de Fuca lying within the territorial limits of the United States bounded on the west by a straight line drawn from Bonilla

Point, Vancouver Island, to the lighthouse on Tatoosh Island, Washington thence to the nearest point of Cape Flattery and bounded on the east by a straight line extending due north from Angeles Point to the International Boundary, shall be closed to the taking of sockeye from June 28 to August 5 inclusive.

- That there shall be a closure of 48 hours duration including Friday and Saturday in all United States Convention waters from August 13 to September 3.
- That the Commission shall relinquish regulatory control of sockeye fishing in all United States Convention waters on September 3.
- 4. That in the waters of the United States of America embraced in Article I of the said Convention it shall be unlawful for anyone to buy, sell, or have in his possession sockeye salmon taken during the times when fishing for or taking sockeye salmon is prohibited therein,
- 5. That nothing contained in any rules or regulations relating to fishing for or taking sockeye salmon shall apply to the taking of sockeye salmon within the waters of the United States of America embraced in Article I of the said Convention by the International Pacific Salmon Fisheries Commission or its servants or agents acting pursuant to its directions for the purpose of exercising its objects under the said Convention.
- 6. That the Commission further recommends that the Director of Fisheries for the State of Washington consistent with authority in him vested implement recommendations which may be made by the International Pacific Salmon Fisheries Commission, through its Chairman, respecting closed periods for fishing for sockeye salmon in those waters of the United States of America embraced in Article I of the said Convention.

Canadian Convention Waters lying easterly and inside of the Bonilla Point-Tatoosh Island Line.

- 1. That there shall be a complete closure to all salmon net fishing in Canadian Convention waters known as Areas 19 and 20 from June 28 to August 5 inclusive, Commission controls in these areas will be relinquished on August 6.
- That there shall be a weekly closure of 78 hours duration including Friday, Saturday and Sunday of each week in the waters of Areas 17 and 18 and District No. 1 from June 28 to August 7.
- 3. That there shall be a weekly closure of 120 hours duration including Friday, Saturday, Sunday, Monday and Tuesday of each week in the waters of Areas 17 and 18 and District No. 1 from August 8 to Sept 19.
 - (a) That in that part of District No. 1 above Pattullo Bridge the weekly closure shall cease 4 hours later than in that part below Pattullo Bridge

irrespective of the length of any of the above specified closures.

- 4. That the opening and closing hours in all areas of Canadian Convention waters shall be substantially the same as those in effect during the 1955 fishing season. The Commission shall relinquish regulatory control of sockeye in Areas 17 and 18 and District No. 1 on September 19.
- 5. That no one shall buy, sell, or have in his possession any sockeye salmon taken in the waters of the Dominion of Canada embraced in Article I of the said Convention during the time fishing for such salmon is prohibited therein.
- 6. That the Chief Supervisor of Fisheries for British Columbia, consistent with authority vested in him, be empowered to implement recommendations which may be made by the International Pacific Salmon Fisheries Commission respecting close times for fishing for sockeye salmon in the waters of the Dominion of Canada embraced in Article I of the saidConvention, by posting a notice of any change of close time so recommended on the cannery or canneries adjacent to the area or areas thereby to be affected at least twenty-four hours before the commencement of such change in close time.
- 7. Nothing contained in any Regulations made pursuant to the Fisheries Act shall apply to the taking of sockeye salmon in the waters of Canada embraced in Article I of the said Convention by the International Pacific Salmon Fisheries Commission or its servants or duly authorized agents acting pursuant to its directions for the purpose of exercising its objects under the said Convention,

Convention Waters westerly and outside of the Bonilla Point-Tatoosh Island Line.

Under the authority of the Convention hereinafter mentioned, the International Pacific Salmon Fisheries Commission at its meeting in Seattle, Wash, on the twenty-first day of January, 1956, hereby makes and adopts the following order and regulation, namely:

"Taking sockeye salmon on the high seas and territorial waters described in paragraph numbered 1 of Article I of the Convention between the United States of America and the Dominion of Canada for the protection, preservation, and extension of the Sockeve Salmon Fisheries in the Fraser River System, signed at Washington on the 26th day of May 1930, shall be permitted by trolling gear only from June 28th to August 5th inclusive, for the year 1956, after which date the International Pacific Salmon Fisheries Commission shall relinquish regulatory control of sockeve salmon fishing within the aforementioned waters; provided that this Order and Regulation shall apply only to nationals and inhabitants and vessels and boats of the United States of America and the Dominion of Canada."

TRADE AGREEMENTS

REVISION OF THE UNITED STATES-PHILIPPINE TRADE AGREEMENT OF 1946 BECOMES EFFECTIVE: The revised United States-Philippine trade agreement, signed on September 6, 1955 came into force on January 1, 1956.

After a half century of free trade, duties are now being levied on Philippine goods imported into the United States at 5 percent of regular tariff rates, and on United States goods imported into the Philippines at 25 percent of regular tariff rates.

Some of the principal changes made in the revised agreement from the original agreement of 1946 are:

A less rapid imposition of United States duties on imports from the Philippines and an acceleration of application of Philippine duties on imports from the United States.

More specific provisions for national treatment of American business activities in the Philippines and reciprocity in treatment for Philippine business activities in the United States.

Elimination of the Philippine exchange tax by substitution of a special import tax to be progressively reduced and eliminated.

Facilitation of reciprocal entry of traders and investors of the two countries.

Yielding to the Philippines control over the exchange rate of its currency and over exchange restrictions.

Elimination of the prohibition against imposition of Philippine export taxes.

Elimination of most absolute quotas on Philippine articles entering the United States.

Under the 1946 agreement, import duties were to be applied by both countries beginning July 4, 1954 at the rate of 5 percent of the basic rate each year for 20 years until full rates were reached after January 4, 1974. The new agreement proposes, with certain exceptions for articles under quota provisions, ordinary custom duties to be collected on articles entered or withdrawn from warehouse at the following percentages of the respective duties:

	Philippine Rate on	United States Rate	The agreement al-	
Years	United States Articles	d States Articles on Philippine Articles		
	(Percent of basic	import duty)	among other items,	
1956-58	25	5	buttons of pearl or shell	
1959-61	50	10	from the application of	
1962-64	75	20	the absolute quota pro-	
1965-67	90	40	visions and to provide	
1968-70	90	60	for diminishing duty-	
1971-73	90	80	free quota. It elim-	
1974-	100	100	inates most absolute	
			quotas on Philippine	

articles entering the United States and increases duty-free quotas on certain Philippine articles subject to declining duty-free quotas in the United States.

The agreement provides for the mutualization of rights either party accords to the other in the disposition, exploitation, development, and utilization of natural resources. Each party has reserved the right to limit the extent to which aliens may engage in fishing.

The protocol of the Agreement has been amended to provide additional description of the terms "United States article" and "Philippine article."

Note: Also see Commercial Fisheries Review, September 1955, p. 116; February 1955, p. 48

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UNITED STATES TRADE AGREEMENT WITH ECUADOR EXTENDED FOR SEX MONTHS: The bilateral trade agreement entered into by the United States and Ecuador on August 6, 1938, and subject to termination on January 18, 1956, was extended by a United States Presidential proclamation until July 18, 1956. The termination of the agreement had been previously postponed in order to arrange a mutually satisfactory commercial arrangement in lieu of the trade agreement.

According to an announcement by the Department of State, the United States now has bilateral trade agreements with eight countries, namely Argentina, Ecuador, El Salvador, Honduras, Iceland, Iran, Paraguay, and Venezuela. In 1947, some 27 of these bilateral agreements negotiated under the Trade Agreements Act of 1934 were in effect. Many of these have been terminated by mutual consent or as the countries became associated by the General Agreement on Tariffs and Trade.

Note: Also see Commercial Fisheries Review, September 1955, p. 90; April 1955, p. 57.

FAO-CARIBBEAN COMMISSION TECHNICAL CONFERENCE ON COOPERATIVES

The second conference of the joint Food and Agricultural Organization (FAO)-Caribbean Commission Technical Conference on Cooperatives was held in Georgetown, British Guiana, from January 23-31. The conference covered, among other things, questions relating to cooperatives for the supply of fishing requisites and for the marketing of fish.

Walter H. Stolting, Assistant Chief, Economics and Cooperative Marketing Section of the Fish and Wildlife Service's Branch of Commercial Fisheries was the U. S. Department of Interior's delegate to the conference.

Also on the delegation were representatives from the U. S. Departments of Agriculture and Labor.

According to a U. S. State Department press release dated January 19, 1956, this will be the second such conference of the FAO and the Caribbean Commission. Its purpose is to assist in the development of rural cooperatives as a means of removing or reducing the disadvantages under which rural people suffer, enabling rural people to participate in government programs for increasing the production of food; raising nutritional levels, and improving the distribution of agricultural and other commodities; and stimulating the economic and social betterment of people in underdeveloped areas. The First Conference was held at Trinidad in January 1951.

In addition to Member Governments of the Caribbean Commission (France, Netherlands, United Kingdom, United States) and the 14 associated local administrations, the following Governments, agencies, and institutions have been invited to send observers to the Conference: Cuba; the Dominican Republic; Haiti; the United Nations; UN Economic Commission for Latin America; International Labor Organization; United Nations Educational, Scientific and Cultural Organization; the Pan American Union; and the Holy See.



Australia

SHRIMP FISHERY: The Australian shrimp fishery is relatively small and the fishing grounds are scattered over wide areas. The catch is used almost entirely for the local market, states a December 21, 1955, dispatch from the United States Consul at Sydney. Negotiations are in progress for the export of shrimp to the United States, and if a number of technical difficulties can be overcome there appear to be substantial trade opportunities. Although there is some evidence that substantial unexploited shrimp resources exist, this would involve additions to the fleet and new packing facilities.

Total production of shrimp during the period July 1, 1954, to June 30, 1955, was 6.6 million lbs., valued at ex-vessel at about US\$2 million. The production for 1953/54 was 4.3 million pounds and for 1952/53 3.3 million pounds.

Shrimp exports are understood to be insignificant. Small quantities have gone to New Zealand and various Pacific islands, and recently samples were sent to the United States and to the United Kingdom.

The shrimp fisheries in Australia are chiefly confined to waters along the north coast of New South Wales and Southern Queensland, although a few are found on the coasts of Southern New South Wales and Victoria. The ocean fishery is still in its early stages of development, but estuarine shrimping, by small boats, has been carried on for many years taking mainly "greasy-back" and "school" shrimp. The shrimp season is principally from June to September. Shrimp fishing is done almost entirely by individual boat owners who have formed themselves into cooperatives for the purpose of packing and marketing their product.

There are no shrimp canneries in Australia, but the fishermen's cooperatives have facilities for freezing shrimp and, in addition, the Queensland Fish Board has freezing equipment. Otter-trawl gear is used and fishing is done by day in inshore waters at depths of less than 30 fathoms.



El Salvador

NEW FISHERIES DEVELOPMENT LAW: Further details concerning the Salvadoran Fisheries Development Law, Decree No. 1961 of October 25, 1955, were made available by the United States Embassy at San Salvador in a dispatch dated December 21, 1955. The law in addition to granting incentives for the development of the fishing industry through tax and duty exemptions, specifies that waters within a 12-mile limit may be fished only by Salvadoran nationals or companies formed in El Salvador with a minimum of 50-percent Salvadoran capital.

In addition to the two fishing boats already operated by the <u>Cooperative Pesquera de Tamarindo</u>, a total of five other fishing boats are expected to start fishing in <u>Salvadoran waters</u> as soon as licenses are granted.



French West Africa

TUNA FISHING OFF FRENCH WEST AFRICA TRIED: Six tuna boats have arrived at Dakar from France and will try tuna fishing on a regular commercial scale off of West Africa. These boats are from the French fishing fleet normally based at St. Jean de Luz. They are newly-constructed and are said to be capable of

remaining at sea for a period of up to 15 days with refrigeration facilities for preserving their catch during that time.

Although fishing off the coast of French West Africa has always been an important source of food for the coastal tribes of the area, it is only within the last few years that consideration has been given to commercial fishing for export. For some time, small quantities of spiny lobsters have been sent to France by air and there has been talk of trials at various other kinds of fishing. However, it is only during the present cool season that an attempt has been made on a large enough scale to indicate whether or not a real expansion of the industry is feasible, states a December 28, 1955, dispatch from the United States Consulate at Dakar.

This season's tuna fishing is the first trial, but the companies behind the venture believe that the boats will be able to pay expenses and also make sufficient profit to justify continuing the operations in the future. A representative from one of the large fish cannery firms in Brest, France, is in Dakar to oversee the operations and to buy the catch.

The large refrigeration plant built by the Government in the port area of Dakar as part of the "Development Plan" for French West Africa is being put to good use in this fishing operation. This refrigeration plant was built as much for possible need in case of an international emergency as it was for present local use. It is much larger than Dakar or the military establishment based on Dakar can possibly use and it has been largely idle since its completion more than two years ago.

The tuna fishing season in this area is not expected to last more than three months and only at the end of that time will it be possible to estimate whether or not continuing operations in future seasons will be profitable.



German Federal Republic

FIRST TURBINE FISHING TRAWLER BUILT: The first turbine-driven fishing vessel in the world is now being tested in West Germany, according to The Fishing News (December 2, 1955), a British fishery periodical. The Braunschweig, built by a Cuxhaven shipyard, was placed in service at that port by a German fishery firm. A sistership, Hof, is lying in the fitting-out yards, and the Frankfurt Am Main, another sistership, is already on the stocks. The Braunschweig and Frankfurt Am Main will be stationed at Bremerhaven and the Hof at Cuxhaven.

Profit considerations have, in the first place, led to the building of a turbineoperated trawler. Apart from this, the unit requires less space.

The water-tube boiler has been designed for a steam pressure of 30 atmospheres with 420-degrees overheating. There is a geared air prewarmer and also a semi-automatic burner for oil-firing. The single housing turbine develops, at its highest point, 1,000 hp. allowing a speed of approximately 13.5 knots.

On the double reduction-drive, a 105 kw. rotary current generator has been geared. Apart from this, there is an auxiliary turbine, with a d.c. generator for the net-winch (155 kw.) and a rotary current generator (105 kw.) for the 220/380 w. ship's current. In addition, there is a reserve air-cooled Diesel engine of 72 kw.

All pumps are electrically-driven. A low-pressure steam installation for distillation of seawater is also built in. The turbine permits usage of a variable-pitch propeller.

The chief dimensions are as follows: length over-all 193 feet, length at water-line 184 feet, width 30 feet, height (at sides) 16 feet. The weight of the <u>Braunschweig</u> is measured at 652 gross registered tons and 243 net registered tons. The capacity of the fish hold is approximately 5,000 baskets. The hold construction is newly-developed, and shows only smooth bulkheads.

For the so-called "active insulation" of its cover, a new tube system has also been developed. The necessary refrigerating plant is accommodated under the forecastle. A hatch in front of the mast and three large modern hatches aft lead to the hold itself. The latter have a three-piece cover and complete insulation. Their extended length permits two discharging gangs to work simultaneously at the same hatch. Unloading requires less time.

The <u>Braunschweig</u> has an action radius of 35 days. The <u>24-man crew</u> is accommodated aft. A long gangway passes through the superstructure. A hospital is also accommodated here.

Under the bridge stands a vacuum liver-cooker, and the electric motor for driving the usual net winch. The vessel is equipped with all the latest electronic equipment.

The radar apparatus is electro-hydraulically operated and all equipment in the gally, including the stove, is run by electricity.

The fishing installation is on the starboard side only.



Iran

EXPORTS OF CAVIAR AND FISH, 1953/54 and 1954/55: The Iranian National Fisheries Co. exported 237,000 pounds of caviar from March 20, 1954-March 20, 1955, according to a December 20, 1955, dispatch from the United States Embassy at Tehran. This represents an increase of 7,000 pounds over the 230,000 pounds

	Table	1 - Iranian Exports	of Caviar, 1953/54-1954/	55	
Country	Year Ending	Year Ending	Country	Year Ending	Year Ending
		March 20, 1954	- Country	March 20, 1955	March 20, 1954
	(Pounds)			(Pounds)	
Morocco		22	France	52,155	30,967
Germany	6,162	2,422	Switzerland	6,765	55
U. S. A	9,739	5,621	Lebanon	224	515
U. K	1,456	431	Holland	20	9,313
Italy	1,767	488	Spain		11
Sweden	6,248	1,764	Belgium	238	20
U.S.S.R. <u>1</u> /	151,998	178,308	Norway		11
Iraq	-	174	Denmark		55
(Continued in opposite column) 1/ 199,212 pounds of miscellaneous fish eggs exported to Sovi			Total		230,177

exported March 21, 1953-March 20, 1954. The bulk of the caviar exports went to Soviet Russia (64.1 percent in 1954/55 and 77.5 percent in 1953/54). France received 22 percent in 1954/55 and 13.5 percent in 1953/54. The United States share increased from 1.1 percent (5,600 pounds) in 1953/54 to 4.1 percent (9,700 pounds) in 1954/55. The balance of the exports (9.2 percent) in 1954/55 are shipped to all other countries. The value of the caviar exports to the United States was about US\$8.21 a pound.

Iranian exports of fishery products other than caviar totaled 73,000 pounds of which 64,000 pounds were reported as exports to the United States. It is probable that the exports to the United States were practically all sturgeon.

Japan

TUNA AND CRAB EXPORTS TO UNITED STATES, JAN. SEPT. 1955: The improvement in the Japanese export trade during the third quarter of 1955 was general, except for frozen tuna which declined to an export value of US\$4.4 million in the third quarter as compared with US\$5.0 million in the second quarter and US\$5.3

Japanese Canned Fishery Products and Marine-Oil Exports to United States, Territories, and Possessions, JanSept. 1955								
	Quantity				Value			
Product	JanMar.	AprJune		Total JanSept.	JanMar.	AprJune	July-Sept.	Total JanSept.
	(Million Pounds)				(Million US\$)			
Tuna, frozen	32,5	35.4	33,6	101.5	5,3	5.0	4.4	14.7
Tuna, canned	3,2	5.6	5,9	14.7	1.5	2.4	2.5	6.4
Crab meat, canned	0.4	1.0	2.0	3.4	0.5	1.0	2.0	3.5
Other canned	2.9	3.6	6.5	13.0	1.8	1.3	2.3	5.4
Total	39.0	45.6	48.0	132,6	9.1	9.7	11.2	30.0
Fish & Marine Animal								
Oils	4.1	10.6	8.5	23,2	1.5	1.7	1.2	4.4

million in the first quarter. Total exports of frozen tuna, canned tuna, canned crab meat, and other canned fish for the third quarter of 1955 actually exceeded the second quarter total by 5.3 percent and the first quarter by 12.3 percent. The export price of frozen tuna declined from 16.3 U.S. cents a pound in the first quarter to 13.1 cents a pound in the third quarter; and for canned tuna from 47.0 U.S. cents a pound to 42.3 cents a pound, a November 15 United States Embassy dispatch from Tokyo reports.



Republic of Korea

UNKRA HELPS FISHING INDUSTRY IN 1955: Included among the numerous operations undertaken in the Republic of Korea in 1955 by the United Nations Korean Reconstruction Agency were loans and UNKRA-imported materials and engines for the construction of fishing boats. Fishing boats (1-25 tons) completed in 1955 numbered 208. At the end of the year 12 boats were under construction and enough lumber and engines were on hand to build up to 200 more vessels and repair about 500 others, states a January 5 United Nations news release.

In addition to the construction of fishing vessels, UNKRA aided in rehabilitating and modernizing three canneries. One in Pusan was reported to have tripled its production with the aid of UNKRA-imported machinery.



Mexico

WEST COAST SHRIMP FISHERY GOOD: Following several years of declining catches, the 1955/56 shrimp fishery on the west coast of Mexico is very good, according to a January 1956 dispatch from the United States consul at Nogales. Freezing plants are working at capacity and the boats dock alongside the wharf 4-6 days waiting to unload catches of 5-8 tons per boat. In the Mazatlan area some of the freezing plants unable to freeze the catches, refice their boats and send them out again for several more days. The boats have been returning with an additional ton or two of shrimp picked up practically outside the harbor.

At the present time there are 14 freezing and packing plants operating in the Nogales area, distributed as shown on the following page.

Shrimp Freezing and Packing Plants in Nogales Area					
Location No. of Plant					
Sinaloa:					
Mazatlan	4				
Escuinapa	1				
Culiacan	1				
Topolobampo	1				
Reforma	1				
Sonora:					
Guaymas	4				
Puerto Padasco					
(Mexicali District).	2				

The only shortage in the shrimp industry of the Nogales area is enough labor to operate the plants. The companies are sending out agents to bring girls from the farms and outlying villages to supplement the local labor.

During the 1954/55 season one of the Mazatlan packing plants experimented with peeling and deveining the shrimp before freezing. The product has met with such success in the United States markets that it is now estimated that within three years approximately 70 percent of all shrimp exported from Mexico will be peeled and deveined.

The prices of shrimp delivered to United States wholesalers have remained fairly steady. Small sizes (up to 50 count per pound) were bringing 43 U.S. cents a pound; the extra large sizes (10-15 count) were bringing up to 85 U.S. cents a pound. The official shrimp closed season in 1956 will be from March 15 to April 15, instead of the usual July 15 to August 15.



Netherlands

PRODUCT AND MARKETING BOARD FOR FISHERY PRODUCTS PROPOSED: A draft bill has been submitted to the Second Chamber of Parliament to provide for the establishment of a Product and Marketing Board for Fish and Fish Products. The bill provides at the same time for the termination of the present Industrial Board for Fish Products, states a December 1, 1955, dispatch from the United States Embassy at The Hague.

The Product and Marketing Board would include all enterprises of the fishing industry such as: production, processing, and domestic trade in fish and fish products. The Board would concern itself with matters pertaining to the relationships between the various stages of production and sale, including the fixing of prices and registration of enterprises. The Board would have no jurisdiction over the establishment, extension, and closing of enterprises, auction transactions, imports and exports, triangular trade, and the sale of surpluses not destined for human consumption.

The managing committee of the Board would consist of 28 members divided equally among employees' and employers' organizations in the production, processing, retail, and wholesale sectors. In the present Industrial Board, the employees have only one representative. For matters pertaining to foreign fish products (canned), a special committee of ten members will be created.



New Hebrides

TUNA CANNERY PLANS ABANDONED: The plans for a new tuna cannery in the New Hebrides (see Commercial Fisheries Review for September 1955, page 103) have been abandoned, according to the November 1955 issue of Pacific Islands Monthly. The original plan was to base the cannery at Santo and utilize skilled Japanese fishermen and equipment procured in Japan.

It is believed that objections by the British residents of the New Hebrides were instrumental in forcing the abandonment of the plan which originally was to provide an alternative industry for the New Hebrides.



Norway

WINTER HERRING PRICE AGREEMENT REACHED: The negotiations concerning the 1956 winter herring price between an advisory committee, named by the Norwegian Wage and Price Department, and representatives of the herring fishermen's sales and buyers' organizations resulted in an agreement on the average price to be paid by the Norwegian Herring Marketing Cooperative. The average price for large herring will be close to US\$31.55 per long ton and spring herring US\$27.04 per long ton. These new herring prices represent an increase of US\$1.88 per long ton over the 1955 price.

Selling prices to the various herring buying groups were increased proportionally. Prices for fat herring and small herring were increased similarly based on the oil content.

In recent years the herring marketing cooperative has assessed the fishermen 20 percent of the cost of loading, transporting, and unloading herring at distant meal and oil plants. According to the December 7, 1955 Fiskaren, a Norwegian trade paper, this assessment has been reduced to 10 percent in the 1956 agreement.

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Norway's most modern fishing vessel, the 400-ton Senior, early in December 1955 docked at Grimsby, England, with a catch of 70 tons of line-caught halibut from Greenland. Owned by a Bergen firm, the vessel was originally built in England as a whaler in 1936, but because the company wanted a ship with an exceptionally strong hull, she was preferred to a brand new vessel. The work of converting her cost US\$238,000 and was completed in October 1955. She is now the most modern and best equipped fishing vessel in Norway. The vessel was primarily designed for the prolific Norwegian herring fishing, but is able to operate in the halibut fishery off Greenland during the herring off-season, the December 9 issue of The Fishing News reports.

The <u>Senior</u> carries a crew of about 25 men when fishing. She is equipped with every possible navigational and fish-finding device and is the only Norwegian fishing vessel to be fitted with the German Aktif rudder, which consists of an auxiliary propeller built into the ship's rudder and coupled to an 80 hp. motor. A similar device is fitted to the German research vessel <u>Anton Dohrn</u>. This device enables the vessel to be manoeuvered easily while fishing and docking and completely eliminates the use of tugs when entering and leaving port.

The <u>Senior</u> carries two dories for herring fishing, using the purse-seining method, or Norwegian "Snurp" nets. At the height of the herring fishery she is capable of landing 300 metric tons of fish an hour, and carries a processing plant aboard for freezing herring and manufacturing meal.

Powered by a 1,200 hp. Diesel engine, the $\underline{\text{Senior}}$ is capable of a top speed of about 15 knots, though normally she does not exceed 12.

The dories are carried on a boat deck aft and also on this deck is sited the main winch and auxiliaries for handling the lines while fishing for halibut.

In addition to the Aktif rudder, the vessel has a special hydraulic steering gear, radar, and echo-sounder, fish finder, and Asdic. The bridge also has an autopilot enabling the skipper to set a course which is automatically kept to a great degree of accuracy.

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NEW FACTORY TRAWLER STARTS FISHING: The new Norwegian factoryship Havkvern (the first of its type) departed on its first trip to the North Sea for herring in early December 1955, according to the December 7, 1955 Fiskaren, a Norwegian fishery periodical. The 165-foot vessel was built in Germany and has a reduction capacity of 50 tons of raw herring per 24 hours. This new experimental ship will operate both as a trawler and a floating reduction plant for fish meal and fish oil and the production will be sold in England.

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COST STUDIES MADE ON TWELVE TRAWLERS: A profit and loss study on the operations of 12 Norwegian trawlers was completed by the Directorate of Fisheries from data supplied by the shipowners. The average value of the catch of the 12 trawlers fishing continuously in the year 1954 was about 1.2 million kroner (US\$167,997). The proceeds from the gross earnings per vessel was divided approximately 56.6 percent to the shipowners and 43.4 percent to the crews of the fishing vessels. The crew's share of the average annual value amounted to 525,000 kroner (US\$73,499) or an annual income per man of 18,000 kroner (US\$2,520), according to the October 13, 1955, issue of Fiskets Gang, a Norwegian fishery periodical.

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 $\frac{\text{WHALE OIL PRICES FOR 1955/56}}{\text{oil started about January 16, 1956}}, \text{ according to a dispatch (January 20) from the United States Embassy in Oslo. Starting prices were about US$245 a metric ton, compared with about US$210.00-212.80 for the 1954/55 season.}$

The poor catch to date is believed to be the principal factor in the improved prices. Norwegian production of sperm oil between November 1955 and the opening of the baleen whaling season on January 7, 1956, totaled 102,000 bbls., compared with 137,000 bbls. in the same period of the 1954/55 season.

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SALT HERRING NEGOTIATIONS WITH RUSSIA HALTED: Trade negotiations between the Norwegians and the Soviet Union for the sale of Norwegian salt herring broke down about the middle of January 1956. The Soviets were reported as being unwilling to pay the higher prices asked by Norwegian exporters to offset increased production costs. It is expected that negotiations will be resumed in the near future, according to a report (January 20) from the United States Embassy in Oslo.

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NO CANNED WINTER BRISLING WILL BE PACKED IN 1956: The Norwegian Canners Association states that no winter brisling will be canned this year. Most of the winter pack of 1955 (about 40,000 cases) is still in the warehouses. The pack in 1955 was an experiment with the low-grade winter brisling. Reports indicate that the Norwegian catches of winter brisling may be exported to Sweden to be packed for outlets in Eastern Germany, because a trade agreement makes it possible for Sweden to sell large quantities of low-grade canned brisling in a market not open to Norwegians.

Peru

LONG-LINE TUNA GEAR EXPERIMENTS: The first Peruvian experiments using Japanese long-line fishing gear for tuna, bonito, shark, and swordfish took place 10 to 100 miles offshore from Callao, Peru, according to a January 12 dispatch from the United States Overseas Mission at Lima.

The results of the experiments during the month of December 1955 indicated that this type of gear would be impractical within the area investigated at depths of 20-40 fathoms because of the abundance of giant squid. The giant squid damaged and destroyed the long lines.

It was reported that the new purse-seine vessels (40-50 feet in length) operating out of Callao are adaptable to long-line fishing except for lack of insulation in the holds of the vessel. This would have to be provided for extended trips.



Spain

VIGO FISHERIES TRENDS, NOVEMBER 1955: Fishing: The landings of fish at Vigo during November 1955 were relatively good, states a December 15, 1955, dispatch from the United States Consul at Vigo. Total landings (12.4 million pounds, valued US\$1.3 ex-vessel) for the month were higher by 8 percent in quantity and 20 percent in value when compared with November 1954. Normally the catch of fish declines seasonally beginning with November and the landings when compared with October 1955 were down by 28 percent in quantity and 20 percent in value.

Weather conditions were favorable, especially for the short-range fleet, during the last 20 days of the month. Those fishing for aguja, or needlefish, used locally as a substitute for sardines, did fairly well. Sardines continued to be scarce as compared with former years but about 1.3 million pounds were caught, principally in Portuguese waters. The scarcity of sardines in Spanish waters and the relatively good price on the local market has resulted in many small Spanish vessels fishing in Portuguese waters. Average ex-vessel prices for all fish landed at Vigo in November 1955 were 9.8 U.S. cents a pound as compared with 9.6 U.S. cents for October 1955 and slightly less than 9.6 U.S. cents for November 1954.

<u>Fish Canning</u>: The fish canning industry was relatively active for this season of the year (but still working at far below capacity) because of the fair catches of needlefish (aguja). There were some sardines and bocarte (for fillets of anchovies) which were also purchased by the canneries and processed. In general, the canneries considered November 1955 somewhat better than the same month in 1954, although far from satisfactory from a general point of view.

During November 1955 the canneries bought 3.7 million pounds, or approximately 30 percent of the total landings at Vigo, as compared with October 1955 when 5.9 million pounds, or approximately 34 percent of the landings, were processed. In November 1954, the quantity processed was only 1.6 million pounds, or 14 percent of the total landings at Vigo.



Union of South Africa

COOKING FAT FROM FISH OIL: A South African company is packing and marketing high-grade cooking fats and cooking oils from fish oil. Two months ago, after long and careful preparations and with a well planned selling campaign, it launched a cooking fat in attractive one-pound and half-pound cartons. The fat contains fish oil and has been approved as completely kosher. It is being remarkably well received by African housewives and cake and biscuit manufacturers.

This product is prepared and packed at Dido Valley in a plant able to turn it out at the rate of 3,000 pounds an hour, the October 1955 issue of <u>The South African Shipping News and Fishing Industry Review reports.</u>

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FISHERIES TRENDS, 1955: South African trade sources state that Russian crab meat is very competitive to South African canned rock lobster in the European market, a November 21 United States consular dispatch from Cape Town points out. On the other hand, Japanese Kegani crab meat is competitive to the South African rock lobster in the United Kingdom market.

However, reports indicate that towards the latter part of 1955 the overseas demand for all South African canned fish improved and that canners' inventories in both the Union and South-West Africa were low.

Union of South African and South-West Africa fish meal, fish oil, and rock-lobster meal sold quite readily and at satisfactory prices on both the domestic and foreign market in 1955.



United Kingdom

CANNED SALMON SUPPLIES REPORTED UNEQUAL TO DEMAND: The question of the scarcity and unequal distribution of canned salmon available to British consumers was brought up in the House of Commons, according to a December 20 dispatch from the United States Embassy in London.

The Minister of Agriculture, Fisheries and Food remarked that the British market could absorb greater supplies of canned salmon, but imports have to be limited for balance-of-payments reasons. Quotas for the 1955/56 season have been increased to about US\$26.6 million c.i.f. and supplies should be more plentiful in the next few months.

It was brought out in the session that some evidence existed of a black market in canned salmon and that consumers preferred top grades. Also, that for balance-of-payments reasons, imports from North America and Japan are controlled and allowed to enter Great Britain only on quota.

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COLORED HERRING DRIFT NET TO BE TESTED: A bright pink-colored herring drift net is to be tried by the British Herring Industry Board, reports the November 25 issue of The Fishing News, a British fishery periodical. This colored net is the first of its kind to be used in Scotland. The net is to be tried out by a herring boat fishing out of Stornoway. Scotland.

The new net, a standard-type drift net, apart from its pink color, is the result of experiments which have been carried out by the Japanese who claim to have discovered that pink is the only color invisible to fish underwater. It is thought that when a pink net is used among a fleet using ordinary dark nets, herring seeking to avoid the other nets will crowd into the "invisible" pink one.

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TRAWLERS COMPETE FOR SILVER COD TROPHY: The British distant-water trawler with the largest annual catch is to be awarded an annual challenge trophy by the British Trawlers' Federation. The trophy is a silver model of a leaping cod mounted on a mahogany stand with silver waves on which will be inscribed the names of the winning crew.



The British silver cod trophy to be presented annually to the distant-water trawler with the largest total catch for the year.

The trophy is to be presented for the first time to the <u>Arctic Warrior</u> of Hull which in 1954 landed 5,869,000 pounds of fish, valued at US\$343,800. It is claimed that the vessel's catch is a world record. All of the vessel's catch came from Arctic fishing grounds.

As the trawler has a crew of 20, this means that the average annual catch per man was 293,000 pounds. A total of 330 days were spent at sea, comprising 16 trips averaging 20.6 days a trip.

The trawler Lorenzo came in second with an annual catch of 5,644,000 pounds, according to The Fishing News (November 11, 1955), a British fishery periodical.



Venezuela

JAPANESE TUNA LONG-LINER LANDS FIRST TRIP: The Japanese long-liner Bozo Maru owned by a Venezuelan national that has been tuna fishing off the Venezuelan island La Blanquilla put into La Guaria January 3, 1956, with 80 tons of fish. The owner reported that the trip consisted of 15 different varieties (mostly tuna), caught in two weeks of fishing. The Japanese captain, who has been tuna fishing some 20 years, described the eastern Venezuelan tuna grounds as the richest in his experience, states a January 10 report from the United States Embassy at Caracas.



YELLOW DISCOLORATION ON INSIDE OF FROZEN FISH FILLET CARTONS

Yellow discoloration on the inner side of fish fillet cartons can be completely avoided by using sulphite board cartons instead of cartons of Duplex board.

--Arsberetning fra Fiskeriministeriets Forsegslaboratorium for 1954.



Department of the Interior

DEPARTMENTAL
REPRESENTATION AT GENEVA
TRADE AGREEMENTS NEGOTIATIONS:

Harry M. Shooshan, International Activities Assistant, Technical Review Staff, was scheduled to leave for Geneva early in February to represent the Department of the Interior at the tariff negotiating conference now convened there. Shooshan is the Department's representative on the Interdepartmental Trade Agreements Committee and the Committee for Reciprocity Information.

Negotiations are under way at Geneva at which the various country delegations bargain for tariff concessions. Under the authority in the Trade Agreements Extension Act of 1955, the United States expects to negotiate tariff concessions with about 20 countries, all parties to the General Agreement on Tariffs and Trade.

According to an announcement (January 17) by the Department of State, the United States delegation to the Geneva negotiations will be made up of 62 governmental members from the various departments concerned and four nongovernmental advisors.

Among the fishery items listed for possible consideration in these negotiations are: shark and miscellaneous fish and fish-liver oils, whale and sperm oils, sodium alginate, pearl essence, isinglass, swordfish, black cod or sablefish, filleted or steaked fresh-water fish, canned smoked sardines valued over 18¢ but not over 23¢ a pound, canned sardines not skinned or boned valued over 23¢ a pound, canned sprats, antipasto, canned smoked salmon, canned bonito in brine, canned mackerel and jack mackerel, canned cod flakes, certain canned herring, canned fish cakes, mild-cured salmon, fresh or frozen frogs and frog legs, fish roe and

caviar other than sturgeon, nylon fish nets and netting, fish hooks, and pearl or shell button blanks.

Herbert V. Prochnow, Deputy Under Secretary of State for Economic Affairs and designated by the President as Chairman of the United States Delegation to the multilateral tariff negotiations convened January 18 by the Contracting Parties to the General Agreement on Tariffs and Trade, in a statement made at Geneva indicated in part:

"...Today thirty-five countries meet in international forum as a matter of course to settle their trade problems. These countries include the leading trading nations of the world. They carry on more than 80 percent of the trade of the entire world.

"The meetings held by these nations have consistently emphasized action. Every annual session has resulted in concrete steps to settle commercial problems between nations or to remove trade barriers. These actions prove the true interest of these nations infreeing international trade from artificial restrictions.

"We are all well aware that the nations of the free world cannot afford to relax the effort to strengthen their economic collaboration. In this effort the method of solving differences and removing barriers to world trade that has been worked out under the General Agreement on Tariffs and Trade can make an important contribution. But in our concentration on the statistical aspects of these negotiations, we must never forget that actions to remove barriers to trade are not merely steps towards stronger and more prosperous economies. They are steps towards world peace.

"One of the most important uses that has been made of the method of multilateral negotiations has been in conference to reduce tariffs. The several negotiating conferences that have been held since 1947, including the recent negotiations held at Geneva leading to the accession of Japan to the General Agreement, have demonstrated the effectiveness of multilateral action in this field. The cumulative result of these conferences has been concessions by the various countries applicable to about 60,000 individual tariff rates. All participating nations have made worthwhile concessions. Approximately two-thirds of the import trade of the Contracting Parties and one-half of the trade of the world is now affected by these agreements.

"The United States has participated actively in each conference. Through the negotiations conducted during these conferences, United States duties have been reduced significantly. Since 1934 the rates on over three-fourths of the dutiable imports of the United States have been reduced by 50 percent or more. And on almost one-fifth of these imports the reductions have been 75 percent or more. ..."

Note: Also see Commercial Fisheries Review, December 1955, p. 66, October 1955, p. 105.

* * * * *

FISH AND WILDLIFE SERVICE

ANNUAL REPORT FOR FISCAL YEAR 1955:

The annual report of the Fish and Wildlife Service issued by the Secretary of the Interior in January 1956 for the year ending June 30, 1955, summarizes the various activities of the Fish and Wildlife Service. These activities ran the scale from demonstrating how to prepare fish for a school-lunch menu to managing the big fur-seal herd on the Pribilof Islands of Alaska. The Service's activities included both equatorial and arctic waters of the deep sea and land areas varying from subtropical swamps to tundra.

Some of the fisheries problems which came in for attention during the period of the report and which will have more attention in the future include such things as efforts to control the sea lampreys which are ruining commercial fishing in the Great Lakes and determination of the life cycle of the hookworm which is taking an annual toll of more than 100,000 fur-seal pups.

Biological research covered a wide field of activities in many parts of the world. Recentlydeveloped methods of predicting shad runs in the Hudson and Connecticut rivers proved successful; limited studies by the Service and coordination of striped bass research conducted by the States under the Federal aid program continued; encouraging results were obtained from experimental fertilization of Bare Lake on Kodiak Island to increase red salmon production; electrical devices to guide salmon over dams were further developed; numerous shellfish problems were given attention; a fleet of five vessels covered thousands of square miles of Pacific waters in a study of distribution, abundance, and identity of salmon stocks; bacterial diseases of fishes, problems relative to Atlantic herring, yellowtail flounder, whiting, sea scallops and gulf shrimp, and a number of other matters relative to the culture and habit of fish came in for field and laboratory study.

Exploratory fishing operations were continued in the Atlantic and Pacific Oceans and in the Gulf of Mexico. Discoveries of long-range importance to the tuna fishery were made in the central Pacific and in the Gulf of Mexico. New fishing areas for ocean perch, shrimp, and albacore were found.

Funds available from the Saltonstall-Kennedy Act permitted added emphasis to fishery research and the development of new marketing outlets for fishery products.

Fishery Market News Offices issuing daily reports on prices and market conditions in the fisheries were maintained at 7 important trading centers throughout the United States. Home economists of the College Park, Md., and Seattle, Wash., test kitchens presented 131 fish-cookery demonstrations to school-lunch personnel in 17 states. Special marketing campaigns were conducted to move surplus stocks of small haddock fillets and canned tuna. There was considerable interest on the part of the fishing industry in voluntary Federal standards for grade and conditions of fishery products. Certain standards had been developed during the previous year and others are being developed.

The commercial fisheries in Alaska yielded products which were valued at \$78 million in 1954, compared with \$70 million in 1953. The salmon pack of 3,094,753 cases, however, was down 12 percent from the five-year average. Salmon fishing in some areas was considerably curtailed to permit a greater reserve for spawning.

The fur-seal harvest on the Pribilof Islands in 1954 was 63,882 skins. This was 2,787 less than in 1953. At the semi-annual auction sale in St. Louis, Mo., 51,336 skins brought \$4,342,103. By agreement with Canada, 20 percent of the Pribilof harvest goes to Canada. In 1954 Canada received 12,776 skins.

The report indicates that to maintain sport fishing the trend is to plant greater quantities of trout of catchable size to keep up with the increasing pressure. During the period covered by the report, the Fish and Wildlife Service operated 89 hatcheries and distributed the product of these hatcheries to waters on Federal lands and to areas near Federal installations. The Service planted almost four million game fish which measured six inches or more at the time of planting. Practically all of these were trout. The total weight of these fish was 767,000 pounds. The Service also reared and distributed 120 million fingerlings, 21 million fry, and 43 million eggs of various species of game and commercial fish.

Reports from the various states show that there were 18.5 million fishing licenses issued during 1954, an increase of nearly a million over 1953.

More than 1,000 projects were carried on by the states during fiscal year 1955 as a result of the Federal aid programs. Under these programs Federal funds from the excise taxes on sporting arms and ammunition and sport-fishing gear are matched in the ratio of three to one with state hunting and fishing license revenues to restore and improve the living conditions for game birds and animals and sport fishes. The Fish and Wildlife Service reviews and approved the projects that are presented by the states, but the work is carried out by the respective state fish and game departments, with the resulting improvements belonging to the states.

Dingell-Johnson money for restoration of sport fishing amounted to \$4,692,000 during fiscal year 1955 and paid for 75 percent of the work on 372 projects. The various state projects under the Federal aid programs included research, land acquisition, construction and development, and maintenance of completed work.

Close cooperation between the Service and the Corps of Engineers and the Bureau of Reclamation was effected during the year. An agreement with the Soil Conservation Service opened the way for the Fish and Wildlife Service to make recommendations on small watershed projects for the protection and improvement of fish and game resources. A total of 265 reports were made on proposed water projects developed by other Federal agencies or which were being considered for Federal license. Plans for a national economic survey of hunting and fishing activities were worked out.

The Service was engaged with the activities of several international fishery conservation organ-

izations during the year. Two major international conferences were held. Changes which the new International Pacfic Halibut Convention made in fishery management resulted in a record catch of 71 million pounds of halibut, an 18 percent increase. Activities of the International Pacific Salmon Fisheries Commission resulted in big catches of sockeye salmon in the Fraser River; a research program was agreed upon by the recently-organized International North Pacific Fisheries Commission. The fifth annual meeting of the International Commission for the Northwest Atlantic Fisheries was held in Ottawa, resulting in a recommendation to member nations that the size of mesh used in trawls for haddock and cod off the Nova Scotia and Newfoundland banks be limited. Agreement was reached with Canada on control of the sea lamprey which has done great damage to the fisheries of the Great Lakes. Service officers attended the United Nations International Technical Conference on Conservation of Living Resources of the Sea, held in Rome in April.



Department of State

UNITED STATES REDUCES TARIFFS ON HARD-SMOKED HERRING AND CERTAIN DRIED FISH:

Since the Norwegian Government gave notice on December 17, 1955 of its intention to make effective their concessions to Japan negotiated at Geneva early in 1955, the United States made effective on January 16, 1956, the concessions in-

itially negotiated with Norway. The items affected are shown below.

These items were withheld from the list of items becoming effective September 10, 1955, along with the bulk of other concessions negotiated in the Japanese agreement because Norway had not given notice of the effective date of its concessions to Japan.

Tar. Par.	Brief Description	Rate Prior to Negotiation	New Rate Effective Jan. 16, 1956	Imports During 1954	
717(c)	Fish, dried & un- salted, other than cod, haddock, hake pollock, cusk, & shark fins.		$\frac{5}{16}$ ¢ per. lb.	Lbs. 654,654	<u>Value</u> \$314,542
720(a) (2)	Hard dry-smoked herring, whole or beheaded	$\frac{1}{2}$ ¢ per · lb.	5 ¢ per. lb.	550,615	51,201

Note: Also see Commercial Fisheries Review, April 1955, p. 78; December 1954, p. 78.



Tariff Commission

PUBLIC HEARING ON INVESTIGATION OF INJURY TO DOMESTIC PRODUCERS BY GROUNDFISH FILLET IMPORTS:

The U.S. Tariff Commission announced that a public hearing will begin

at 10 a.m. E.D.S.T., on June 5, 1956, in the Hearing Room of the Tariff Commission, 8th and E. Streets, NW., Washington, D. C., in connection with Investigation No. 47 under section 7 of the Trade Agreements Extension Act of 1951,

as amended, instituted January 16, 1956, with respect to Tariff Act of 1930 Par. 717 (b) "Cod, haddock, hake, pollock, cusk, and rosefish, fresh or frozen (whether or not packed in ice), all the foregoing, filleted, skinned, boned, sliced, or divided into portions."

The Commission instituted this investigation to determine whether the products described are, as a result of the duty or other customs treatment reflecting concessions granted on such products under GATT, being imported into the United States in such increased quantities as to cause or threaten serious injury to the domestic industry producing like or directly-competitive products.



Eighty-Fourth Congress (Second Session)

Listed below are public bills and resolutions that directly or indirectly affect



the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber actions on

the bills shown are published; and if passed, they are shown when signed by the President.

ALASKA FISHERIES TRANSFER (Alaska Organic Act): H, R, 8405 (Utt) introduced in the House January 12; a bill to amend the Organic Act of the Territory of Alaska and for other purposes. Included in the bill is a provision that "the jurisdiction, supervision, administration, and control over the salmon and other fisheries and game of Alaska, heretofore and now invested in the Department of the Interior, are hereby transferred to and vested in the Territory of Alaska. to be exercised by the Territorial legislature. . . . "the authority and jurisdiction hereby conferred upon the territory of Alaska shall not extend to the fur-seal or sea-otter fisheries, nor to the supervision or control of the Pribilof Islands, including the islands of Saint Paul and Saint George, Walrus and Otter Islands, and Sea Lion Rock, but that such authority and jurisdiction over said fur-seal and sea-otter fisheries and supervision and control of the said Pribilof Islands, shall remain in the Department of the Interior as heretofore,'

H. R. 8405 is similar to H. R. 244, introduced in the first session of this Congress by Delegate Bartlett of Alaska,

Also, H. R. 8833 (Dawson of Utah), 1/26/55; H. R. 9215 (O'Brien), 2/9/55; H. R. 9224 (Sisk), 2/14/55; all similar to H. R. 8405 and H. R. 244 and referred to the House Committee on Interior and Insular Affairs,

COMMERCIAL FISHERIES NATIONAL POLICY: H. R. 2001 (Wilson) introduced in the House January 3, 1956; a bill to establish a national policy with respect to commercial fisheries, to establish the office of Assistant Secretary of Commerce for Commercial Fisheries, and define his functions, powers, and responsibilities; to strengthen the commercial fisheries segment of the National economy; and for other purposes,

January 24: H. R. 8731 (Forand), H. R. 8744 (Matthews), and H. R. 8755 (Scudder). January 26: H. R. 8357 (Sikes), February 2: H. R. 9031 (Ashley). Similar to H. R. 8001 (Wilson) and all referred to the Committee on Merchant Marine and Fisheries. (Also see Commercial Fisheries Review, January 1956, p. 64.)

CONSERVATION MOVEMENT 50TH ANNIVERSARY:
H. J. Res. 486 (Burdick) introduced in the House January 25, 1956. To provide for the observance and commemoration of the fiftieth anniversary of the official founding and launching of the conservation movement for the protection, in the public interest, of the natural resources of the United States,

January 25; H. J. Res. 487, 488, 489, 490, 493, 494; January 26-February 8; H.J. Res. 497, 498, 502, 504, 506, 520, 525; all similar to H. J. Res. 486 and referred to the Committee on the Judiciary.

FISH HATCHERY: S. 3036 (Murray and Mansfield) introduced into the Senate January 24; a bill to provide for the establishment of a new fish hatchery in the vicinity of Miles City, Mont.; to the Committee on Interstate and Foreign Commerce. Also January 25: H. R. 8810; February 2: H. R. 9040 (Fjare); all similar to S. 3036 and referred to the Committee on Merchant Marine and Fisheries,

FISHING VESSEL MARINE INSPECTION: H. R., 9047 (O'Neill) introduced in the House February 2; a bill for the safety of life and property by making all commercial fishing vessels subject to the rules and regulations of the United States Coast Gluard marine inspection; to the Committee on Merchant Marine and Fisheries.

"... That the phrase fishing vessel when used in this Act shall include every commercial fishing vessel of over fitten gross tons, propelled in whole or in part by machinery, and while engaged in such commercial fishing operates ourside the line dividing the high seas from the inland waters.

"Sec. 2. Every fishing vessel shall be inspected at least once a year by inspectors assigned by the UnitedStates Coast Guard Officer in Charge of Marine Inspection or his representatives. These inspectors shall carefully inspect the hull and machinery of every fishing vessel, and satisfy themselves that every such vessel is of a structure suitable for the service for which she is to be employed, and is in good and seaworthy condition; that all the requirements of law in regard to lifeboats and their equipment, life preservers, life buoys, pumps, radio, alarm bells, first-aid kits, sounding equipment, and bulkheads, and all other equipment are faithfully complied with, and if the inspectors deem it expedient they may adopt any suitable means to test the vessel and her equipment,

"Sec, 3. Fishing vessels must be hauled out on a slip or drydock at least once a year or oftener if found necessary, At such drydock examinations the inspectors shall carefully examine the underwater body, all underwater fittings, and propeller to determine that the same are in good condition. The outboard shaft or shafts on all fishing vessels must be drawn for inspection once every three years, or oftener if found necessary.

- "Sec. 4. Every fishing vessel shall be equipped with at least two bilge pumps, one of which may be used as a fire pump, and of sufficient capacity that not less than one hundred cubic inches of water shall be discharged by each stroke of the piston.
- "Sec. 5. Every fishing vessel shall carry at least two approved ring buoys with not less than fifteen fathoms of line attached, and so placed that they are readily accessible at all times; also one approved life preserver for each person on board.
- "Sec. 6. Every fishing vessel shall carry a sufficient number of lifeboats or dories to accommodate at one time all persons on board. Such lifeboats or dories must be at all times ready for immediate use and be equipped with emergency rations to last for at least seventy-two hours, one lantern showing a white light or flare-up light, one bailer, one hatchet, one boathook, and at least one full set of oars.
- "Sec, 7 Each fishing vessel must have the crew's quarters and mess room fitted with an approved alarm bell to be used in an emergency, and is to be operated from a switch in the pilothouse and independent of the ship's power; also one fully equipped first-aid kit, a radio, or other means of communication between ships and shore. On all fishing vessels of one hundred gross tons and over a speaking tube is to be installed between the pilothouse and the engineroom to be used in an emergency in case of failure of the bell system or engineroom telegraph,
- "Sec. 8. No fishing vessel shall be navigated or operated except in charge of an operator licensed for such service by the United States Coast Guard Marine Inspection. All fishing vessels which operate oceans more than twelve hours out of the twenty-four hours in any one day must be in charge of a licensed master. Masters, mates, and engineers at present holding licenses for uninspected fishing vessels may have their licenses changed to inspected fishing vessels by applying to the nearest United States Coast Guard Marine Inspection offices not later than sixty days after the passage of this Act. Masters who are not licensed at present but who have had one year's experience as master may be licensed by applying to the United States Coast Guard Marine Inspection Service after being given an oral examination as to their knowledge of the rules of the road at sea and chart navigation. Chief engineers may also be given an oral examination as to operating an engine and be so licensed,
- "Sec. 9. No fishing vessel shall depart on any trip unless the owners, master, or agent leaves at the office of such owners, or some other place determined by the officer in charge of the United States Coast Guard Marine Inspection Service, a list of the names and addresses of such officers and crew members on said voyage.
- "Sec, 10. All fishing vessels shall be equipped with a linecarrying gun and projectiles as prescribed by the United States Coast Guard Marine Inspection Service General Rules and Regulations.
- "Sec, 11, All fishing vessels shall be fitted with reasonably watertight bulkheads, one to be forward of the engineroom and one to be aft of the forecastle, and of such con-

- struction as to be strong enough to hold the water in whatever compartment may be flooded in case of a collision or serious leak in such compartment, Also a reasonably watertight flat should be provided to prevent flooding of the engineroom in case of a leak in the stern or in the stern tube,
- "Sec, 12. All fishing vessels using internal-combustion engines must be equipped with carbon dioxide or foam-type fire extinguishers, or any other approved fire extinguishers which have demonstrated their ability to extinguish burning oil; the minimum as for freight and towing vessels under section 61,13 of the General Rules and Regulations and the maximum to be decided by the officer in charge of the United States Coast Guard Marine Inspection Service in the district wherein the vessel is inspected. Also, fire hose and nozzles as needed must be provided,
- "Sec. 13. No major repairs or alterations are to be made to the hull or machinery of any fishing vessel without the approval of the officer in charge of the United States Coast Guard Marine Inspection Service at the port in which said repairs or alterations are to be made. For all new construction of fishing vessels, the keels of which are to be laid not later than sixty days after the passage of this Act, all plans and specifications must be approved by the United States Coast Guard Marine Inspection Service or other recognized classification society,
- "Sec, 14. All fishing vessels where the plans and arrangements will possibly permit all enclosures where crews may be quartered or where anyone may be employed shall be provided with not less than two avenues of escape, so located that if one of such avenues is not available, another may be,
- "Sec. 15. All equipment of fishing vessels such as hose, axes, oars, rafts, life preservers, boats, floats, barrels, and tanks shall be painted or branded with the name of the vessel upon which they are used.
- "Sec. 16. All fishing vessels to be equipped with anchors and ground tackle equivalent to the American Bureau of Shipping Rules and Regulations as to weight and size,
- "Sec. 17. The Commandant, United States Coast Guard, shall establish all necessary rules and regulations required for the most efficient manner in inspecting fishing vessels after the passage of this Act,
- "Sec. 18. Nothing in this Act shall be deemed to alter the Motor Boat Regulations of the Motor Boat Act of 1940."
- FOOD DISTRIBUTION COST STUDY: H. Res. 371 (Moulder) introduced in the House January 12. To authorize the Committee on Interstate Commerce and Foreign Commerce to conduct an investigation and study relating to the share of moneys paid by consumers for food products that is absorbed by carriers, and by processors and wholesalers. Also introduced in the House February 2; H. J. Res. 397 (Doliver); similar to H. Res. 371 referred H. J. Resmittee on Rules,
- IMPORT CUOTAS: H. R. 8954 (Lanham), H. R. 9069 (Bailey), H. R. 9077 (Dorn, South Carolina) introduced in the House February 6, 1956; to regulate the foreign commerce of the United States by establishing import quotas under specified conditions and for other purposes, H. R. 8954 is a revision of H. R. 7925 (Lanham) and includes some modifications to conform with actual import situations, such as the importation of canned tuna. In H. R. 8954 the base period for figuring import quotas on tuna is changed to read any three-year period since 1948.

Also introduced in the House February 2: H. R. 9040 (Wilson); February 6: H. R. 9170 (Byrd); all similar to H. R. 8954 (Lanham) and referred to the Committee on Ways and Means.

TRADE AGREEMENTS ACT REPEAL: S. 2926 (Malone) introduced in the Senate January 12; a bill to repeal the Trade Agreements Act of 1934. The purpose of the bill is return the tariff-making powers to Congress as provided by the Constitution. Under this bill the tariffs would be fixed by the Tariff Commission.

WATER POLLUTION: H. R. 8108 (Broyhill) introduced in the House January 5, 1956. A bill to extend the duration of the Water Pollution Control Act, to authorize additional amounts for construction loans thereunder, and for other purposes. Also introduced in the House January 30: H. R. 8885 (Bailey) and referred to the Committee on Public Works; introduced in the Senate February 8: S.3162 (Butler) and referred to the Committee on Public Works, All similar to H. R. 8108 (Broyhill).



SONAR AND RADAR

One of the basic differences between sonar and radar is in the medium in which each operates. Sonar waves travel through water and radar through the atmosphere. The main difference however, is the frequency and rate of speed that the impulses travel. Sonar employs ultrasonic waves which travel at about 4,800 feet per second in water, or approximately 4 times the speed of sound. The frequency of sonar is between 25 to 300 kilocycles. These frequencies are, of course, higher than those that humans are capable of hearing. Radar, on the other hand, travels at 186,000 miles per second, or the speed of light. In other words, an impulse sent from a radar unit will reach a target approximately 200,000 times faster than an impulse sent from a sonar unit to the same target. The frequency of radar is much higher than that of sonar, lying in a range of 300 to 3,000 megacycles. The principle of both units is the same in that they send out impulses which strike an object and return to be picked up by the set. From the time that elapses when the impulse is first sent out and the time that it returns, the distance of the target can be determined. This calculation is made automatically by the instrument,

The major units of a radar set are a transceiver, which transmits impulses to and receives their returning echoes from the antennae; the antennae itself, which projects the impulses into the atmosphere and receives their returning echoes; an indicator, which receives the returning signals from the transceiver and converts them into images which are displayed on the viewing scope, a cathode ray tube.

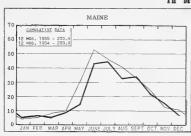
The major units of a sonar set are a transducer or projector that is mounted in the hull of a vessel. This unit sends out and receives the impulses which are then relayed to the main unit in the cabin. Here a continuous record of the successive echoes is printed by means of an electric stylus on a special recording paper. When an impulse is sent out, sufficient time is allowed for its echo to return and be recorded before the next impulse is sent out.

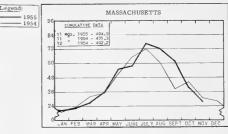
--<u>Sea Secrets</u>, July 13, 1954, The Marine Laboratory, University of Miami, Coral Gables, Fla.

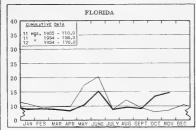


CHART I - FISHERY LANDINGS for SELECTED STATES

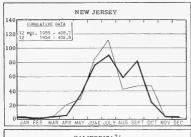
In Millions of Pounds

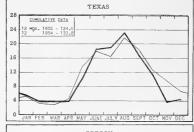














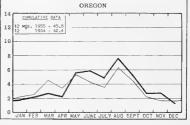
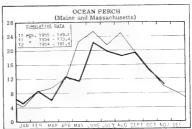


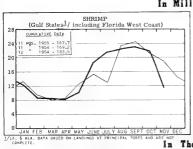
CHART 2 - LANDINGS for SELECTED FISHERIES

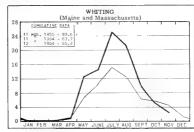




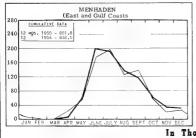


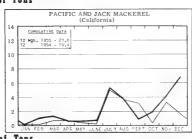
In Millions of Pounds



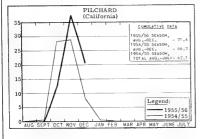


In Thousands of Tons





In Thousands of Tons



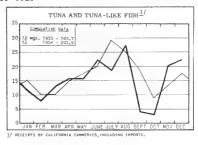
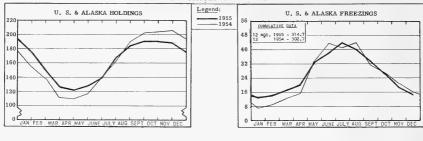
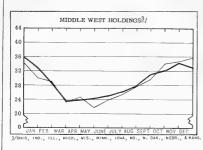


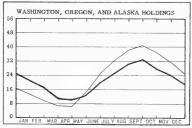
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

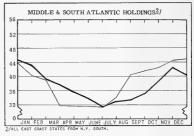
In Millions of Pounds

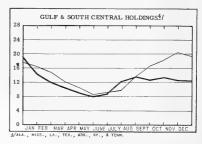


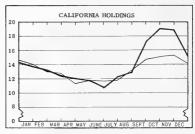






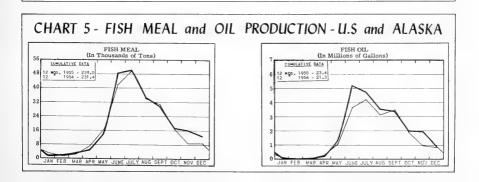






*Excludes saited, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS In Millions of Pounds RECEIPTS1/ AT WHOLESALE SALT-WATER MARKET COLD-STORAGE HOLDINGS $\frac{2}{}$ (FRESH AND FROZEN) NEW YORK CUMULATIVE DATA CITY 1 MQ. 1956 - 10.9 1 1955 - 12.4 12 MOS. 1955 - 165.4 26 20 22 16 12 1.0 0 0 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DI REPORTED BY PLANTS IN METROPOLITAN AREA. JAN FEB MAR APR MAY JUNE JULY AUG SEPT J'INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT AT NEW YORK CITY. RECEIPTS AT WHOLESALE MARKET COLD-STORAGE HOLDINGS (FRESH AND FROZEN) CHICAGO CUMULATIVE DATA 14 12 10 0 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV JAN FEB MAR APR MAY JUNE JULY AUG SEPT DCT NOV DEC SEATTLE BOSTON WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN) COLD-STORAGE HOLDINGS CUMULATIVE DATA 1 NO. 1956 - 3.7 1 NO. 1955 - 3.5 12 NOS.1955 - 95.7 24 20 16 20 16



Legend:

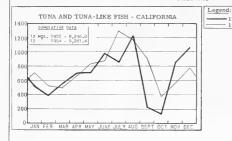
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DE

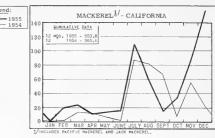
..1956 -1955

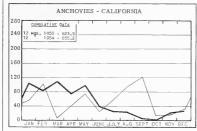
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

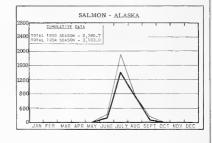
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



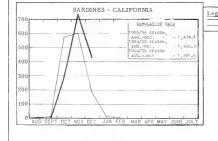






- 1	CUMULAT.	VE DATA		 	 -
1200	P Mgs . 195	5 - 1,264. 4 - 2,934.	8 9		
1000					
800					
600			_/		
400			_/_	 7	
- 1			/_	\nearrow	
200					

STANDARD CASES								
Variety	No. Cans	Can Designation	Net Wa	ţ.				
SARDINES	100	1 drawn	3½ o	z,				
SHRIMP	48		5 o	z,				
TUNA	48	No. ½ tuna	6 & 7 o	z,				
PILCHARDS	48	No. 1 oval	15 o	z,				
SALMON	48	1-pound tall	16 o	z,				
ANCHOVIES	48	1 lb.	8 o	z,				



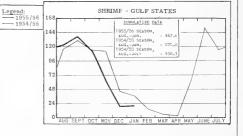
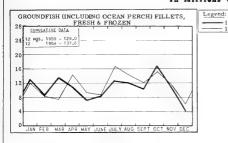
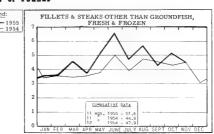
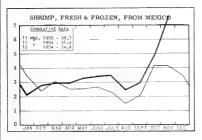


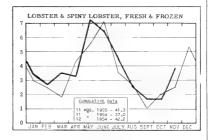
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

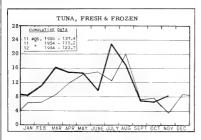
In Millions of Pounds

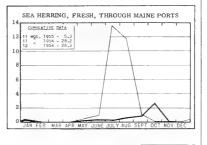


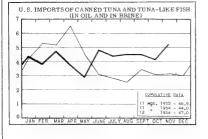


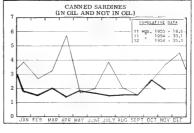














FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATION. NATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRO-

DUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

MDL - MARKET DEVELOPMENT LISTS.

SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number Title CFS-1220 - Massachusetts Landings - August 1955, 5 pp.

CFS-1225 - Texas Landings - September 1955, 3 pp. CFS-1228 - New Jersey Landings - September 1955, 2 pp.

CFS-1229 - North Carolina Landings - September 1955, 2 pp.

CFS-1230 - Frozen Fish Report - October 1955. 8 pp.

CFS-1233 - Alabama Landings - September 1955, 2 pp.

CFS-1235 - Maine Landings - September 1955, 4 pp. CFS-1236 - Rhode Island Landings - September

1955, 3 pp. CFS-1237 - Mississippi Landings - September 1955,

2 pp. CFS-1238 - California Landings - June 1955, 4 pp. CFS-1239 - California Landings - July 1955, 4 pp.

CFS-1241 - New Jersey Landings - October 1955, 2 pp. SL - 26 - Wholesale Dealers in Fishery Products, Illinois, 1955 (Revised)

Market Development Lists (Revised): MDL- 7 - Indiana Locker Plants, 9 pp. MDL-26 - Colorado Locker Plants, 7 pp. MDL-40 - Idaho Locker Plants, 5 pp.

Sep. No. 424 - Reduction of Curd in Canned Salmon Prepared from Frozen Fish - Part II -Effect of pH and Salt Content.

Sep. No. 425 - Utilization of Sea Lions in Alaska. Sep. No. 426 - Some Factors Affecting Fluid Loss in Southern Oysters.

Sep. No. 427 - Research in Service Laboratories (January 1956): Contains these news items--"Manufacture of Experimental Menhaden Fish Meal on a Pilot-Plant Scale;" "Canned Sardine Specification Revised;" "Collaborative Program Between Seattle Fishery Technological Laboratory and University of California;" "Feeding "Feeding Fresh-Water Fish to Fur Animals;" "Possible Use of Alaska Fishery Wastes as Poultry Feed;" "Progress on Oyster Research."

THE FOLLOWING SERVICE PUBLICATION IS AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fisheries Trends and Review for 1953, by V. J. Samson, 31 pp., processed. (Avail-able free from the Market News Service, U. S. Fish and Wildlife Service, Post Office Building, San Pedro, Calif.) This is a review of the 1953 trends and conditions in the California fisheries. Among the subjects discussed are the tuna fishery (cannery receipts, ex-vessel prices, imports of frozen tuna, canned tuna market conditions and price quotations, and consolidations of tuna-canning facilities); California sardine (pilchard) fishery (landings, ex-vessel prices, canned pack, and canned sardine prices); mackerel fishery (landings, and ex-vessel prices); anchovy fishery; freezings of fishery products; imports; and shrimp fishery. Included in the statistical tables are data on tuna receipts and canned pack by months and species; landings and products of sardines (pilchards) by months, products, and areas; landings and pack of mackerel and jack mackerel by species and months; production of miscellaneous fishery products; freezings of fish and shellfish; cold-storage holdings; landings of market fishery products at certain California ports; and imports of fishery products into Arizona and California.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25. D. C.

Factors Associated with Fluctuations in Abundance of Hudson River Shad, by Gerald B. Talbot, Fishery Bulletin 101 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 44 pp., illus., printed, 35 cents, 1955. A study of the Hudson River shad, Alosa sapidissima, was undertaken during 1950 and 1951 as part of a shad investigation carried out by the Fish and Wildlife Service to supply information to the Atlantic States Marine Fisheries Commission for fishery regulation along the Atlantic coast. Catch and effort statistics were obtained for the years 1915 through 1951, from various sources, for the gill-net fishery which catches more than 95 percent of the shad in the Hudson River. A tagging program during 1951 gave estimates of the total shad population entering the river that year. The total run and the escapement (since the catch was known) were then calculated for each year from 1915 through 1950. Age analysis of a sample of the catch of 1950 and 1951 showed that most shad returned as adults to the river at 4 and 5 years of age. Also, about 50 percent of the fish had previously spawned. It was shown that about 85 percent of the variation in size of the run between 1920 and 1951 could be attributed to the size of the

escapement from the fishery. No correlation was found between the size of the run each year and such factors as stream flow, water temperatures, channel improvements, ship traffic, or hatchery operations. No evidence of natural cycles of abundance was found. Catches of Hudson River shad in waters outside the river were shown to be large, and these catches may affect the expected size of the run. Using the methods outlined, the size of run can be predicted 1 year in advance, and by controlling the fishing efforts, the desired number of shad can be allowed to escape so that future runs can produce maximum sustained yields of shad from this river.

Limnological Study of the Lakes in Convict Creek
Basin, Mono County, California, by Norman
Reimers, John A. Maciolek, and Edwin P.
Pister, Fishery Bulletin 103 (From Fishery
Bulletin of the Fish and Wildlife Service, vol.
56), 70 pp., illus., printed, 50 cents, 1955.

Pink Salmon Tagging Experiments in Icy Strait and
Upper Chatham Strait, 1950, by Carl H. Elling
and Paul T. Macy, Fishery Bulletin 100 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 45 pp., illus., printed, 40 cents, 1955. Although migration routes of pink salmon, Oncorhynchus gorbuscha, in Southeastern Alaska were generally defined as the result of tagging experiments in the 1920's and 1930's, a more critical examination of the racial composition of the various runs was needed. During the summer of 1950, 17,400 pink salmon were tagged in Icy Strait and Upper Chatham Strait to determine the timing and composition of the runs contributing to the fishery in those areas. Recoveries of fish tagged in Icy Strait confirmed the findings of preceding experiments. Pink salmon were found to disperse easterly through Icy Strait, south into Chatham Strait, and then east and north into Frederick Sound and Stephens Passage. Smaller groups proceeded to Lynn Canal and Peril Strait. There was little movement to westerly areas of Chichagof Island and into and beyond Sumner Strait. Recoveries of salmon tagged in Upper Chatham Strait showed a predominant southward movement through Chatham Strait, an easterly and northerly movement into Frederick Sound and Stephens Passage, and a northward migration toward Icy Strait. Extensive stream recovery of tagged fish suggests that pink salmon bound for Stephens Passage, Chatham Strait, and Icy Strait streams passed through Icy Strait at about the same time. Icy Strait races were in evidence from July 25 to September 5, Upper Chatham Strait races from August 1 to September 5, and Stephens Passage races from July 25 to August 30. Recoveries from Upper Chatham Strait taggings of August 20 to September 3 were concentrated in Chatham Strait streams. A few recoveries were made in Stephens Passage, Frederick Sound, and Peril Strait.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND STANDARD FROM THE ORDER OF THE ORDER OR THE ORDER OR THE ORDER OR THE POLICATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

Analysis of the Fishing Operations of 99 Long-Liners and Draggers in the Atlantic Provinces, 1954, by John Proskie, assisted by P. L. Breau, M. Daneau, R. G. Gosselin, D. A. MacFarlane, and W. J. MacPherson, Production Studies vol. 4, 75 pp., processed. Department of Fisheries of Canada, Markets and Economics Service, Ottawa, Canada, April 1955. A report of a study undertaken to obtain information for guidance in the Department of Fisheries of Canada's program of assistance for modernization of the fishing fleets of small and medium-size vessels owned by fishermen. While its results will be of greatest interest to administrators -- provincial and federal -- and of course to fishermen themselves, they may also be useful to "management" in the fishing industry who have a stake in the success of a modernization program that may improve the supply of raw material for their processing plants. The author states that, "Our object has been to investigate the performance of several classes of fishing craft under current cost-price relationships. Records covering three years are now available for a reasonably good sample of long-liners and draggers fishing out of ports on the Atlantic Coast. In spite of the limited number of boats covered in some areas, the operational results in each case show roughly the unequal fishing effort, volume of landings, income, and expenditure. These data provide a basis for orientation of the outcome of the modernization policy followed and indicate theprofitability and degree of economic efficiency in operations of the various types and sizes of boats working the same or similar fishing grounds."

Annual Report-Passage of Fish over Bonneville
and McNary Dams, Columbia River, Oregon
and Washington, 1954, 131 pp., illus., processed.
Portland and Walla Walla Districts, Corps of
Engineers, U. S. Army, Portland, Oregon.

(British Columbia) Provincial Department of Fisheries Report (with appendices) for the Year Ended December 31st, 1954, 101 pp., illus printed. Provincial Department of Fisheries, Victoria, B. C., 1955. The first part of this report is devoted to an analysis of British Columbia's 1954 production and value of fishery products, the canned salmon pack, and a review of the salmon canning industry. Also discussed are the other canning industries (pilchard, herring, tuna, and shellfish), the production of processed fish (mild-cured salmon, dry-salted salmon, and dry-salted herring), the halibut fishery, fish oil and fish meal, net fishing in non-tidal waters, value of Canadian fisheries and the standing of the provinces for 1953, and species and value of fish caught in British Columbia. A report on the herring investigation and the 1954 report of the biologist on the oyster and clam investigations are included. The second section consists of these articles: "Contributions to the Life-History of the Sockeye Salmon (No. 40)," by D. R. Foskett; "The Status of the Major Herring Stocks in British Columbia in 1954-55, "by F.H.C. Taylor; "Report of the International Pacific Salmon Fisheries Com-mission for 1954;" "Report of the International Pacific Halibut Commission, 1954;" and "Salmon-Spawning Report, British Columbia, 1954. The report concludes with detailed statistical tables on the British Columbia fisheries.

California Cooperative Oceanic Fisheries Investigations, Progress Report, 1 July 1953 to 31 March 1955, 52 pp., illus., printed. Department of Fish and Game, Marine Research

Committee, Terminal Island Station, San Pedro, Calif. A report on the progress of the California Cooperative Oceanic Fisheries Investigations for the period July 1, 1953, through March 31, 1955. This report is divided into three main sections: (1) a brief review of sardine research since the beginning of the program, 1947-55; (2) a formal scientific paper, entitled "Population Dynamics of the Pacific Sardine," by Frances N. Clark and John C. Marr; and (3) a list of all publications that have arisenfrom the work under the California Cooperative Oceanic Fisheries Investigations.

Canada's Economic Prospects, 140 pp., illus., processed. The Fisheries Association of Eritish Columbia, Vancouver, B. C., Canada, November 1955. A brief, submitted to the Royal Commission by the Fisheries Association of British Columbia, outlining trends in the fishing industry during the next 25 years. According to the brief, "The commercial fishery of British Columbia is a public heritage, that is a renewable food resource, capable of development, and which provides employment and food for the people of Canada. The careful cultivation, maintenance, and development of this fishery will have a beneficial effect on the economic future of British Columbia. In reviewing the industry's growth and in forecasting its future, the brief points to three basic principles: (a) That this public heritage must be protected, conserved, and developed rather than destroyed through facilitating the growth of other industries; (b) That the primary responsibility of regulation, conservation, and development rests with the governments of British Columbia and Canada; and (c) Because production far exceeds domestic consumption, the industry requires a framework of world trade permitting the continued development of our export markets." The brief deals primarily with the major fisheries, salmon, herring, halibut, and to a lesser degree, groundfish and shellfish. Projections have been made for each of the major fisheries based on the principle that through suggested conservation measures their volume can be materially increased. It describes the manner in which the fisheries of British Columbia have been built to their present status and the development that is forecast for the future. In conclusion the brief states that, "While natural resources are best developed by private initiative willing to assume the risk inherent in resource development, such an opportunity only exists in part for the fishing industry. Therefore, the policies we advocate recognize the peculiar responsibility that the government has with regard to this resource. While the industry is confident that the increased production can be marketed, it will continue to be dependent to a great extent upon export markets. Entry into these foreign markets is therefore essential and government policies should be directed towards this objective. Through a proper combination of government and industry initiative and control, it is believed that there will be a continuous growth of this great renewable food resource -- the British Columbia fisheries."

- (Chile) Direccion General de Pesca y Caza, Publicacion No. 1, 15 pp., illus., processed in Spanish. Departamento Tecnico-Economico, Direccion General de Pesca y Caza, Ministerio de Agricultura, Valparaiso, Chile, December 1955. Contains two articles: "Aparejos de Volantines para Redes de Arrastre" (Kite Rigs for Otter Trawl Gear), by R. T. Whiteleather; and "Redes de Arrastre Flotantes" (Floating Trawls), by William S. Krason.
- Contribution a L'Etude de L'Oecologie de la Sardine (SARDINA PILCHARDUS, Walb.) dans L'Adriatique Orientale, by Radosna Muzinic, 222 pp., illus., printed in French. (Reprinted from Acta Adriatica, vol. V, no. 10, pp. 241-457). Institut za Oceanografiju i Ribarstvo, Split, Yugoslavia, 1954.
- "Customs Simplification in the United States," by R. G. C. Smith, article, Foreign Trade, vol. 104, no. 12, December 10, 1955, pp. 6-8, printed, single copy 20 cents. The Queen's Printer, Government Printing Bureau, Ottawa, Canada. Describes the United States Customs Simplification Bill, which is designed to simplify customs procedures and to amend the present methods of valuation for duty purposes. This article was written for the purpose of explaining the regulations under which Customs appraisers must operate under the United States Customs Act.
- (FAO) So Bold an Aim, by P. Lamartine Yates, 179 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955. An account of ten years of international cooperation toward freedom from want. It describes the influences which contributed to the creation of the Food and Agriculture Organization of the United Nations (FAO) and its development and achievements during the first ten years of operation. This book does not attempt to recount FAO's brief history or to portray the work currently being done by this organization, but to assess its significance in relation to the endeavors of men and nations in striving for higher standards of living.
- Fifty Years of Norwegian Fisheries, 1905-1955, by G. M. Gerhardsen, 20 pp., illus., processed. Indiafondets Fiskerikurs (Norwegian Training Centre for Indian Fishery Officers), Bergen, Norway, December 1955. A brief history of the Norwegian fisheries with graphical illustrations showing the development and changes in the fisheries from year to year.
- Fish Conservation Highlights of 1955, bulletin no. 50 (January 1956), 74 pp., printed. Sport Fishing Institute, Bond Building, Washington 5, D.C.
- Fish Saving (A History of Fish Processing from Ancient to Modern Times), by Charles L. Cutting, 385 pp., illus., printed, \$12. Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y. (See review in December 1955 issue of Commercial Fisheries Review, p. 71.)
- Forsok pa en Driftsokonomisk Vurdering av Fiskemelanlegg av S-M-typen med og uten Utstyr

for Opparbeidelse av Fett Rastoff (An Evaluation of the Economic Operation of a Stord-Myren Fish-Meal Plant with and without Equipment for Handling Fat Raw Material), by Einar Sola, 41 pp., illus., printed in Norwegian. (Reprinted from Report on Technological Research concerning Norwegian Fish Industry, vol. III, no. 2) Fiskeridirektoratets Kjemisk-Tekniske Forskningsinstitutt (Norwegian Fisheries Research Institute), Bergen, Norway, 1955.

- Freezing Seafoods, by Kirby M. Hayes and Carl R. Fellers, Special Circular No. 230, 3 pp., processed. Extension Service, University of Massachusetts, Amherst, Mass., December 1953. Contains instructions for the preparation, packaging, and storage of fish and shellfish in home freezers.
- "Globes of Glass: Ocean's Best for Beachcombers," by Leslie L. Haskin, article, Pacific Discovery, vol. VIII, no. 6, November-December 1955, pp. 4-9, illus., printed, single copy 50 cents. California Academy of Sciences, Golden Gate Park, San Francisco 18, Calif. An interesting article on collecting glass floats which have been torn by storms or accidents from the nets they once supported and washed ashore.
- Growth, Population Dynamics, and Field Behavior in the Spiny Lobster, PANULIRUS INTERRUP-TUS (Randall), by Robert G. Lindberg, 92 pp., illus., printed. (Reprinted from University of California Publications in Zoology, vol. 59, no. 6, pp. 157-248.) University of California Press, Berkeley, Calif., 1955.
- Glossario de Nomes dos Peixes (Glossary of Names of Fishes), by Jeronimo Osorio de Castro, Publicacao No. 20, 249 pp., printed. Gabinete de Estudos das Pescas, Lisboa, Portugal, 1954.
- Inter-American Tropical Tuna Commission Annual
 Report for the Year 1954 (Comision Interamericana del Atun Tropical Informe Anual Correspondiente al Ano 1954), 101 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif., 1955. Included in this report are: the recommended program of investigations; progress on investigations; membership changes; and a short resume of the Commission's regular annual meeting at San Jose, Costa Rica, on August 11, 1954. An appendix to the report describes the investigations conducted by the Commission during 1954, and discussed in this section are the compilation of current statistics of total catch, amount and success of fishing, and abundance of fish populations; compilation and analysis of historical data on tuna and bait fishes; research on theory of fishing; research on the biology, life history, and ecology of the tunas; investigation of the oceanography of the tropical Eastern Pacific; and investigations of the biology and ecology of bait fishes. The Commission, established by a Convention between the United States and Costa Rica in 1950, has the purpose of gathering and interpreting factual information to facilitate maintaining the populations of tunas and tuna-bait fishes at levels which will permit maximum sustained

- catches year after year. To this end it is authorized and directed by the Convention to conduct necessary scientific investigations of all kinds, to publish reports on its research results, and to recommend, on the basis of its scientific investigations, proposals for joint action to maintain the fish populations at levels permitting maximum sustained yields.
- International Commission for the Northwest Atlantic Fisheries, Annual Proceedings, vol. 5 for the year 1954-55, 74 pp., illus., printed. International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1955. This bulletin presents the administrative report of the Commission for the year ending June 30, 1955, including financial statements; a report of the Fifth Annual Meeting of the Commission, June 6-11, 1955; summaries of research during 1954 broken down by country, and a compilation of research reports by subareas; and a list of scientists and laboratories engaged in the various branches of the Commission's work.
- Jahresbericht uber die Deutsche Fischerei, 1954 (Annual Report of the German Fisheries, 1954) 354 pp., illus., printed in German. Unterabteilung Fischwirtschaft des Bundesministeriums fur Ernahrung, Landwirtschaft und Foresten in cooperation with Mitwirkung des Statistischen Bundesamtes, 72 Neuer Wall, Hamburg 36, West Germany. (Publisher: Mann Bros., Berlin, Germany), October 1955. Presents 1954 statistics for fishery landings and imports in considerable detail as well as the number of vessels, new building, personnel employed, etc. In the section devoted to the main fishing ports of Bremerhaven, Cuxhaven, Hamburg-Altona, and Kiel, details are given of the firms operating trawlers, together with the number operated and the type.
- The Law and Regulations Relating to the Packing of Sardines Providing for License and Standards (Revised Statutes, 1954, Chapter 32, as Amended by P. L. 1955), 16 pp., printed. Division of Inspection, Maine Department of Agriculture, Augusta, Maine, 1955.
- Life History and Management of the Grayling in Interior Alaska, by Frank J. Wojcik, 78 pp., illus., typed. (A thesis presented to the Faculty of the University of Alaska in partial fulfillment of the requirements for the degree of Master of Science.) University of Alaska, College, Alaska, 1955.
- The Marine and Fresh Water Fishes of Ceylon, by Ian S. R. Munro, 421 pp., illus., printed. Division of Fisheries, Commonwealth Scientific and Industrial Research Organization, Cronulla, N.S. W., Australia, 1955. Descriptions, illustrations, and identification keys to 846 species of fish from the marine, brackish, and freshwaters of Ceylon and the adjacent waters of the Gulf of Manaar. Also includes a glossary of technical terms and a bibliography of published works which deal specifically with the fish fauna of Ceylon.
- "Milkfish are Breeding in Lake Ano Ava," by H. van Pel, article, SPC (South Pacific Commission)

Quarterly Bulletin, vol. 5, no. 1, January 1955, pp. 33-34, illus., printed. South Pacific Commission, Noumea, New Caledonia.

- Natriumnitrit som Konserveringsmiddel for Fabrikksild. Foringsforsok med Sildemel av Konservert Sild og Undersokelser over Virkningen av ren Natriumnitrit pa Husdyr (Sodium Nitrite as Preservative for Herring. Feeding Experiments with Herring Meal from Preserved Herring and Investigations on the Effect of Sodium Nitrite in Farm Animals), 96 pp., illus, printed in Norwegian with summary in English. (Reprinted from Reports on Technological Research concerning Norwegian Fish Industry, vol. III, no. 4.) Fiskeridirektoratets Kjemisk-Tekniske Forskningsinstitutt (Norwegian Fisheries Research Institute), Bergen, Norway, 1955.
- Neue Wege der Elektrofischerei (New Ways in Electrical Fishing), by Meyer-Waarden, no. 227, 7 pp., illus., printed in German. (Reprinted from Elektronik, vol. 4, no. 7, July 1955.) Bundesforschungsanstalt für Fischerei Institut für Kusten- und Binnenfischerei, Hamburg, Germany.
- "Norges Fiskerier, 1954 (Norwegian Fisheries, 1954)," article, Fiskets Gang, vol. 41, no. 50 December 1955, pp. 665-674, printed in Norwegian with summary in English. Fiskeridirektoren, Postgiro Nr. 691 81, Bergen, Norway. A review of the fisheries of Norway for 1954. Includes data on the quantity and value of each species, ex-vessel prices, and utilization of fishery products.
- "Poisonous Fish of the South Pacific," by Guy Loison, article, SPC (South Pacific Commission) Quarterly Bulletin, vol. 5, no. 4, October 1955, pp. 28-31, illus., printed. South Pacific Commission, Noumea, New Caledonia. Certain species of tropical fish are well-known as being dangerous to eat. Others, however, are poisonous only if eaten at certain periods, or if taken from certain localities. As there is no rule to determine either, or a simple test to reveal toxicity, fish poisoning is common in the tropics. The problem is surveyed by the author, who urges further research to determine causes and cures.
- Port Facilities along the Maine Coast, compiled and edited by Chester A. Swett, 140 pp., printed, Department of Sea and Shore Fisheries, Vickery-Hill Bldg., Augusta, Maine, May 1955. This booklet, prepared as a service to the commercial fishermen of Maine as well as salt-water sport fishermen, gives information on the following port facilities along the Maine coast: post office; gasoline; diesel oil; groceries; ice; fresh water; telephone; hotels and motels; repairing; marine railway; public moorings (town-owned and rentals); depth at moorings; public landings (town and privately-owned); depth at landings; yacht clubs; depth at yacht clubs; winter storage (covered and open); anchorage; depth at anchorage; and kind of bottom.
- Proceedings of the Gulf and Caribbean Fisheries
 Institute, Seventh Annual Session, Havana, Cuba, November 1954, 205 pp., illus., printed, \$1. The Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, Coral Gables, Fla., September 1955. Contains all of the papers presented at the seventh session (Havana, Cuba, 1954) of the Institute. At the Industry Session the papers presented dealt with voluntary Federal and industry standards for fishery products; standards for crab meat; shrimp industry standards of quality; voluntary Federal grade standards for fish sticks; and how voluntary quality standards work in the frozen fruit and vegetable industry. Papers for the Technology and Exploratory Fishing Session discussed further experiments on the control of melanosis or "black spot" on shrimp; maintenance of quality of seafood products during transportation; immersion freezing of shrimp aboard the fishing vessel; fish oils and proteins: their contribution to the world's feed supply; recent explorations for yellowfin and deep-water shrimp in the Gulf of Mexico; and a practical method of dispersing aureomycin chlortetracycline in ice. Subjects of the papers presented at the Economic Session included: introduction to the problems of marine insurance in the fishing industry in the United States; some observations on the insurance of commercial fishing vessels; labor accidents law of the Republic of Cuba and its application to the fishing industry; insurance of small boats in the Barbados, B.W.I., fishery; the fisherman and his insurance; and fishing vessel insurance in Norway. The Biological Session presented papers on a comparison between giant bluefin tuna (Thunnus thynnus) from the straits of Florida and the Gulf of Maine, with reference to migration and population identity; growth of subpopulation of mullet (Mugil cephalus) on the West Coast of Florida; seasonal movements and growth of the Atlantic croaker (Micropogon undulatus) along east Louisiana coast; behavior of shrimp in an electrical field; laboratory experiments with shark repellents; and some problems concerning the management of the shrimp fisheries. At the Caribbean Session the papers presented dealt with fluctuations in the abundance of red snapper (Lutjanus aya) on the Campeche Banks; the first year of the shrimp fishery in Cuban waters; and another look at the Caribbean fisheries.
- Review of the Oceanography of the Northern Pacific, by Richard H. Fleming, Bulletin No. 2, 50 pp., illus., printed. International North Pacific Fisheries Commission, Vancouver, B. C., Canada, June 1955.
- Santiago Negotiations on Fishery Conservation
 Problems, 73 pp., processed. Public Services
 Division, Department of State, Washington 25,
 D. C., 1955. Representatives of the United
 States met with representatives of Chile, Ecuador, and Peru at Santiago, Chile, from September 14 to October 5, 1955, to negotiate an
 agreement for the conservation of fishery resources of the eastern Pacific. While considerable progress was made in clarifying the

views and interests of the parties to the negotiations, the delegations encountered basic problems which stood in the way of reaching agreement and led to the suspension of the negotiations in order that further consideration might be given to those problems in the respective governments. An article (Department of State Bulletin, vol. XXXIII, no. 860, December 19, 1955, pp. 1025-1030) on the four-power negotiations on fishery conservation problems is presented. In addition, the documents presented by the delegations to the negotiations and other relevant documentation are included.

The Scientific Reports of The Whales Research Institute, No. 10, 169 pp., illus., printed. The Whales Research Institute, Tokyo, Japan, June 1955.

(South Carolina) Annual Report, 1954-1955, Contributions from Bears Bluff Laboratories No. 18, 15 pp., illus., printed. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1954-June 30, 1955) Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1956. A report covering the activities of Bears Bluff Laboratories for the fiscal year 1954-55. Bears Bluff has continued its work with oysters; has added research on shrimp, crabs, and fish; and studies them both in their natural habitats and the salt-water ponds impounded from marsh creeks at the Wadmalaw Island site of the station.

SPC (South Pacific Commission) Quarterly Bulletin, Pacific Fisheries Issue, vol. 5, no. 3, July 1955, 52 pp., illus, printed. South Pacific Commission, Noumea, New Caledonia. Contains, among others, the following articles: "Fisheries in the South Pacific," by Ha. van Pel; "Tuna Fishing with the Japanese Longline," by Ha. van Pel; "Fishing Poisons of the South Pacific," by Jacques Barrau; "Fish: A Valuable Pacific Island Food," by Emile Massal; "Fishery Investigations in Papua and New Guinea," by A. M. Rapson; "Rehabilitation of Pearl Oyster Beds in French Oceania," by Gilbert Ranson; "Pond Culture of Tilapia," by H. van Pel; and "Fishmetric tons of fish-limetric tons of fis

eries Development in Netherlands New Guinea," by D. C. Zwollo.

"A Study of the Nature of Pigment Cells of Oysters and the Relation of Their Numbers to the Fungus Disease Caused by <u>Dermocystidium marinum</u>," by J. E. Stein and J. G. Mackin, article, <u>The Texas Journal of Science</u>, vol. VII, no. 4, <u>December 1955</u>, pp. 422-429, illus., printed. Texas Journal of Science, Box 8012, University Station, Austin, Texas.

Vitaminer i Norsk Fisk. II. Vitaminer i Forskjellige Oranger fra Makrellstorje (THUNNUS)
THYNNUS) Fanget Utenfor Norges Vestkyst
(Vitamins in Norwegian Fishes. II. Vitamins
in Different Organs from Tuna, Thunnus thynnus,
Caught off the West Coast of Norway), by Olaf
R. Braekkan with technical assistance of Kirsten Hansen and Thor Skogland, 19 pp., printed
in Norwegian with summary in English. (Reprinted from Report on Technological Research
Concerning Norwegian Fish Industry, vol. III,
no. 3.) Fiskeridirektoratets Kjemisk-Tekniske
Forskningsinstitut (Norwegian Fisheries Research Institute), Bergen, Norway, 1955.

TRADE LIST

The Office of Intelligence and Services, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies of this list may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 each.

Oils (Animal, Fish and Vegetable) - Importers,

Dealers, Producers, Refiners, and Exporters—
West Germany and Berlin, 36 pp. (December 1955). Lists the name and address, size of firm, and type of business of each firm. Includes a brief summary of 1952-54 data on domestic production and consumption of all fats and oils from agricultural and marine sources and import dependence in percentages. The United States share of imports in 1954 included 34,200 metric tons of fish-liver oils and other marine fats and oils or one-third of West Germany's total imports of these products.



Editorial Assistant -- Ruth V. Keefe

Illustrator -- Gustaf T. Sundstrom

Compositors -- Jean Zalevsky, Alma Greene, and Helen Joswick

* * * * * *

<u>Photograph Credits:</u> Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

Page 26--J. Pileggi, and p. 72--Gustaf T. Sundstrom

TUNA ONE OF THE GREATEST PROTEIN FOODS

Nutritionally, tuna is one of the greatest of all protein foods. Actually, it wasn't until the drastic meat shortage during the first World War that the attention of nutritionists, home economists, and dietitians was directed to fish as an important protein source. A critical evaluation of experiments conducted during that period and since has indicated that fish protein has a high biological value which is probably somewhat above that of beef protein and equivalent to milk protein.

Fish protein supplies the body with a rich source of amino acids, the essential building block of body protein. It has been proved that the daily requirements of essential amino acids are supplied by an average serving of canned tuna.

Noteworthy is the high content in canned tuna of vitamin $\rm B_{12}$ and Animal Protein Factor, a growth factor which builds body protein and develops vital red blood cells.



Devilled tuna loaf.

Tuna also provides a considerable portion of the daily minimum requirement of iodine, the element which prevents the development of goiter,

Another factor is the high fluorine content which contributes to tooth development and helps protect against future dental decay.

Tuna also ranks high in phosphorus which builds strong bones.

In substantial quantity, too, are the A and D vitamins as well as the B group such as thiamine.

riboflavin, and niacin, which are all-important for maintenance of normal metabolism and growth.

The value of tuna to the homemaker, however, extends far beyond its nutritional qualities. One of its greatest advantages is its versatility. Not only does tuna make a flavorful dish when served alone, but it lends itself in combination with so many other foods: to such "extenders" as macaroni products, rice and potatoes; or to egg dishes such as omelets and souffles; or to many vegetables. When combined with another food in casseroles and main-course dishes, a single seven-ounce can of tuna is ample for as many as four to six servings.

Salads, salad dressings, sandwich spreads, relishes and sauces, hors d'oeuvres, gelatin molds, casseroles, fish cakes, loaves, chowders, bisques, and pastries are some of the many ways in which tuna can be used to provide healthful meals. Hearty tuna casseroles make tasty and vitamin-rich cold weather fare; for Summer serving, a vegetable salad fortified with tuna makes an appetizing main course, and tuna salad sandwiches have long been warm-weather favorites. Tuna is also ideal for snack time, and of course, a supply of tuna on the pantry shelf is a safeguard against any unexpected dinner guest.

The economy value of tuna is another advantage. There is absolutely no waste in a can which is packed compactly and compressed to assure solid value to the consumer. As appealing to children as to grown-ups, tuna is an all-around food for nutrition, flavor, versatility and economy.

--Tuna -- A Saga of the Sea, Tuna Research Foundation (Calif.)

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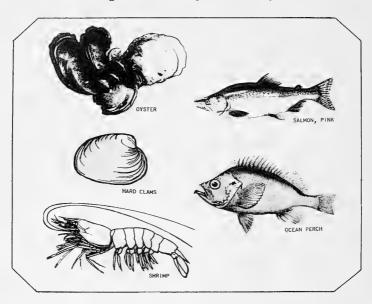
CORRECTION

In the December 1955 issue of Commercial Fisheries Review, page 83, under Portugal the listing "Canned Fish Exports, January-June 1955. . ."

should read "Canned Fish Exports, January-July 1955. . ."

LENTEN SUPPLIES OF FISH AND SHELLFISH OFFER WIDE VARIETY

A wide variety of fish and shellfish will be available for home and institutional use during the Lenten season, according to the U.S. Fish and Wildlife Service. Because of the many forms in which fish and shellfish are marketed, the Lenten consumer can be assured of variety, economy, convenience, high nutritive value, and attractive meals during this traditional period of heavy fish and shellfish use.



Since variety is one of the keys to successful meal planning, the Fish and Wildlife Service home economists have prepared a series of tested recipes which should be particularly useful to the meal planner during Lent. The following publications are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at the prices listed. The recipes contained in these booklets are based on servings of six portions per meal.

	Price Per Copy
BASIC FISH COOKERY, TKS 2	20 cents
HOW TO COOK OYSTERS, TKS 3	10 cents
HOW TO COOK SALMON, TKS 4	15 cents
HOW TO COOK OCEAN PERCH, TKS 6	10 cents
HOW TO COOK SHRIMP, TKS 7	15 cents
HOW TO COOK CLAMS, TKS 8	20 cents

For the large quantity user of fish and shellfish, a special booklet has been prepared, based on servings of one hundred portions per meal. Titled \underline{Fish} Cookery For One Hundred it is also available, at a cost of 30 cents per copy, from the Superintendent of Documents. It is particularly useful for church and other types of social dinners, and for restaurant use.

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COMMERCIAL DEVICES FISHERIES ILL



Vol. 18, No. 3

MARCH 1956

FISH and WILDLIFE SERVICE United States Department of the Interior Washington, D.C.

JOHN L. FARLEY, DIRECTOR



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U.S. Department of the Interior, Washington 25, D.C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/3 $\sqrt{57}$)

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COVER: Large bluefin tuna being landed onto the deck of a French Moroccan trap boat. Large floating fish traps or pound nets used to catch tuna often stretch some distance off shore. From the size of the bluefin tuna in the photograph, the schools probably resemble those taken by the fish traps located near Provincetown, Mass.

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FLORIDA FISH MARKETING STUDY-- PROGRESS REPORT^{1/}

By Barton Westerlund*

BACKGROUND

The fortunes of the Florida fisheries for finfish have suffered a marked decline during the past few years. Basically, the decrease can be attributed to three factors: first, increased competition from other seafood, meat, and other protein products; secondly, accelerated growth of the supermarkets and conversion of the supermarkets to self-service, with their reliance

on frozen processed products; and thirdly, the failure of the Florida fishing industry to take advantage of many of the production, processing, marketing, and technological improvements that have occurred during the past few years. The Florida fishing industry (excluding the shrimp industry segment) has made only casual attempts

Mullet (Mugil cephalus)

to offer the supermarket customer a packaged product and has expended little effort to improve the quality of the product being distributed to its present market outlets. In short, most segments of the Florida fishing industry have remained static during the period when great changes have been taking place in practically all other sectors of the American economy.

While this condition applies to most of the Florida fisheries, the problem is most serious in the mullet fishery, the backbone of the State's fisheries economy. Fishermen were receiving good prices for mullet from 1948 to 1952, and producers found little difficulty in marketing their catches. Some areas along the Florida coast experienced shortages of fish during this time, and as a consequence The Marine Laboratory of the University of Miami began biological studies on behalf of the State Board of Conservation in order to assist the industry to increase the mullet catch. The market price of mullet decreased rapidly after 1953 and The Marine Laboratory shifted its emphasis from biological investigations to an analysis of market conditions. This pilot study showed the desirability of doing a complete market analysis. This study was begun with State funds, but upon passage of the Saltonstall-Kennedy Act, Federal assistance was directed toward the solution of the problem. A contract with the U. S. Fish and Wildlife Service was signed in October 1954. This report represents the first progress report to the industry of this contract project.

The research during the past year has centered around the following points:

- 1. The past, present, and future markets for Florida mullet.
- 2. The forces competitive with the markets for Florida mullet.
 1/ This study at the University of Miami under a contract with U. S. Fish and Wildlife Service is financed from funds made available by Public Law 466, 83rd Congress, known as the Saltonstall-Kennedy Act, approved July 1, 1954.

* Research Assistant Professor, The Marine Laboratory, University of Miami.

- 3. The most promising expansion of present markets.
- An evaluation of the present methods of handling, preserving, packaging, shipping, and selling fish, with the objective of bringing new ideas to the trade.

The research staff engaged in the mullet market research project is composed of 2 market researchers, 1 biologist, and 1 statistician. The staff members have now spent over 50 weeks in the field. Over 600 persons have been interviewed in the Southeastern States and the major metropolitan areas of the North. Cooperation on the part of the fishing industry has been excellent.

The research team has (1) conducted an intensive study of the price structure, channels of distribution, transportation, advertising, promotion, and publicity of the industry; (2) analyzed the established markets and explored new markets; (3) studied the factors affecting quality and its effects on the market; (4) analyzed data pertaining to the retail survey; and (5) set up a controlled promotional experiment. The objective is to put mullet and the other finfishes of Florida into their proper market perspective.

FACTORS CONTRIBUTING TO DECLINE IN THE VALUE OF THE MULLET MARKET

There is a decreasing demand for mullet in the eastern part of the United States. At the present time (November 1955) the dealers in Florida are having a difficult time selling mullet. Some of the fishermen in the St. Petersburg-Cortez area are not fishing because of a fishermen-management dispute, yet in spite of the fact that some fishermen are not presently fishing for mullet, other fish dealers cannot sell their product.

Probably the best way to indicate the extent of the decline in the consumption of mullet is to point out that in the years 1941 to 1949 inclusive, the State of Florida produced and sold an average of slightly over 40 million pounds of mullet a year. During the years 1950 through 1954, Florida produced 26 million pounds of mullet a year, or an average of 14 million pounds a year less than in the period 1941-49.

Adequate landing records for other states are not available, but a field survey conducted in Mississippi revealed that the landings of mullet there also have been sharply curtailed in the past few years due to market conditions.

Some areas that formerly consumed large quantities of mullet have almost been totally lost as mullet markets. For example, the market for mullet in the Nashville area has been lost to whiting and it is expected that well over a million pounds of whiting will be sold during this current year (1955). This is also true of Birmingham, where whiting also has replaced mullet to a large degree.

Four years ago, 10,000 pounds of mullet a week was being shipped to Cincinnati, but today a maximum of 3,000 pounds per week is being consumed in that area. Since it is no longer economically feasible to truck mullet into Cincinnati, most of the mullet are shipped by Railway Express. Because of the high express rates (\$7.50 per 100 pounds) mullet is automatically priced out of range of competitive products such as whiting and scup (porgy). Many retailers in small towns cannot afford to purchase mullet because of high express rates.

Consumption of mullet in other parts of the southern market is decreasing. This statement is supported by the following illustrations:

1. A large wholesaler in Georgia who was formerly one of the principal distributors of mullet in the south has almost completely converted to frozen foods.

2. Scup (porgy) is rapidly taking over markets in which mullet was formerly the principal fish sold. The U. S. Fish and Wildlife Service's New York Fishery Market News report dated Friday, June 24, 1953, states: "The market had a plentiful supply of scup which had to be moved to southern markets; prices to the local trade were about 5-10 cents, to the shipping trade 4-7 cents." In March of 1955, scup were being delivered to North and South Carolina for as little as 6 cents a pound, and were being retailed for 25 cents a pound. Mullet were being delivered for 16 and 17 cents a pound, and retailed for the same price as scup at 25 cents a pound. The wholesalers and retailers in that area naturally encouraged the sale of scup (porgy) because they could make a wider margin of profit on that species of fish.

Thus the mullet industry has lost some markets and has been relegated to the number two position in other areas, such as North and South Carolina.

We may now ask: "Why are sales less and value lower?" Part of this question has already been answered. As the market area for mullet decreases, competition for the remaining markets depresses the price. The average ex-vessel price for mullet has decreased from 11¢ a pound in 1951 to 8¢ in 1954. This three-cent price differential amounted to a loss of over \$800,000 at the ex-vessel level alone in the year 1954.

In addition to these factors, long-run trends are in operation that have harmed the mullet market in the past, and will continue to do so unless changes are made in the fishery. One of these trends is toward the supermarket. The housewife naturally keeps her own work at a minimum. She has the alternative of buying fresh fish (which she may have to scale and clean, which are frequently messy, and which have to be used soon) or she can buy from a variety of attractively-packaged frozen products in the supermarket (some of which need only to be heated and served, and all of which can be stored until required). The amount of work and fuss is much less in the latter case, and the buyers' preference is clearly shown.

The United States production of frozen fish in consumer-size packages alone increased from 43 million pounds in 1950 to 77 million pounds in 1953. This is exclusive of cello-wrapped frozen fish, and breaded, cooked, or other frozen specialty fishery products, and excludes fish sticks. In 1953, 7.3 million pounds of fish sticks were sold; in 1954, this jumped to 50.1 million pounds; and in 1955, the estimated consumption will be 70 million pounds.

In order to bring into sharp focus the amazing growth of the supermarket in this country, some figures are quoted from the annual report of the Super Market Institute:

- "1. Age of supermarkets: The supermarket industry is a young industry. Over 1 out of 8 supermarkets are less than one year old... over 1 out of 3 are less than three years old... 1 out of 2 are less than five years.
- "2. Growth of self-service: Close to half of the supermarkets (47 percent) are already completely self-service in all four major departments, grocery, meat, produce, and dairy.
- "3. It is estimated that 92 percent of supermarket sales are made by the self-service method,
- "4. In the year 1954, 475 million-dollar-or-more supermarkets were opened up.

"5. In 1955, definite plans call for the opening up of 975 new supermarkets. This means that for every 10 supermarkets as of January 1, 1955, there will be 13 by January 1, 1956."

Another trend affecting the consumption of fresh fish is the rapid increase in per capita income. As income rises, the demand for more expensive food products increases. This is probably partly responsible for the increase in the production of shrimp. In Florida this rose from 23 million pounds in 1950 to 51 million pounds in 1954.

Certainly a highly important factor in the loss of markets by fresh fish has been the inferior-quality fish reaching the market. This is because the fish have

Florida Shrimp (Heads on) Landings								
Year		Quantity						
		Million Lbs.						
1954		50.8						
1953		52.8						
1952		43.8						
1951		37.9						
1950		22.9						

been inadequately cared for from the time of catching to the time of sale to the consumer. Today the consumer demands a better quality product than they used to, and the mullet industry has not appreciably improved quality in recent years. Northern and foreign fish producers have improved their quality, and they have captured part of the Southern market.

In the cases where mullet have been frozen, too often this has been a device to prevent the loss of partly-spoiled fish, rather than to offer high-quality frozen mullet which can compete with frozen packaged fish from other areas.

A final factor mentioned which contributes to declining mullet markets is the fact that producers in the past have failed to take adequate care of customers. This has limited expansion of the Northern markets. One exception to this general rule is the Detroit market. Because of care by the suppliers serving Detroit, today this city is one of the best Northern markets for mullet, consuming more than a million pounds of mullet a year.

RECOMMENDATIONS TO THE INDUSTRY

Recommendations to the industry center around three major points: First, better quality; secondly, new product development; and thirdly, advertising and promotion.

It is essential that mullet--and all other Florida seafood--be of the highest quality when it reaches the market. In order to assure the consumer of quality products, there could be improvements in the method of prechilling and boxing fish, the construction and temperature of frozen food cabinets, and the method of refrigeration.

Several "new" mullet products should be tried, or their present use expanded. Florida's seafood industry and the mullet industry in particular should give more attention to the trend toward packaged and processed fish. The supermarket offers excellent market opportunities for packaged items, and mullet producers should make a product which supermarkets can handle. Mullet can be economically frozen and packed as fish sticks or fillets. Several leading members of the industry have had some success with this, and more trials should be made.

There is a substantial market for a fresh packaged product, and mullet can be packaged fresh economically and profitably. Several areas have promoted this product very successfully.

A sizable smoked mullet market exists and can be expanded. Several Northern smokers have expressed interest in trying mullet in their markets. Small-size mullet are ideal for this product.

The Food Technology Department of the University of Miami (in connection with this marketing study) is experimenting with canned mullet. A product has resulted which appears to be capable of acceptance by the public, and may easily provide an outlet for large quantities of mullet.

A packaged fresh or frozen roe will sell. In many areas, wholesalers and retailers could not get enough roe to supply demand.

After producing a top-quality product, and in the form necessary for consumer acceptability, the third major step is to inform the consumer that this product is available. This can be accomplished by the expanded use of advertising and promotional work.

Very little advertising is now being done by members of the industry. Some retailers advertise mullet, but their advertising is rather uninspired. Industry-wide advertising of Florida fish is unknown. By contrast the Florida citrus industry plans to spend \$4,922,248 during the current fiscal year for advertising. A coordinated advertising campaign by the entire industry would do much to make the public aware of the desirability of mullet as a food fish.

Advertising could also be placed with all leading media, including magazines, home sections of newspapers, and institutional publications. Use of the home programs in radio and television would be especially desirable.

But paid advertising is not enough; many people do not know that mullet is even edible. The industry needs favorable publicity. A number of devices could be used; for example, industry-sponsored recipe contests. The dealers in each area could cooperate by distributing entry blanks and promotional literature to fish retailers. Advertising and publicity by local newspapers would increase interest in the contest. Wholesalers could take the initiative and offer the retailers point-of-sale material, such as show cards, streamers, and recipes. As part of the research program, a controlled promotional experiment is being conducted,

Another promotional device is the U. S. Fish and Wildlife Service's school-lunch program which can introduce Florida fish to children, and convince them of the excellence of this food.

It is apparent from these investigations first, that if Florida fish is to be successfully sold on the American market, it must be a top-quality product; secondly, the consumer must be educated to the product; and thirdly, the product must be marketed in a sufficient variety of outlets so that the optimum level of income will be reached.

This study has shown certain weaknesses in the marketing practices of the Florida fishing industry, but it is felt that solutions can be found for these weaknesses. It is hoped to be able to produce detailed recommendations at the conclusion of this investigation which will enable the fishing industry to increase its sales.



MICHIGAN LOCKER-PLANT SURVEY

By William I. Cabaniss*

BACKGROUND

Sales of frozen fishery products can bring extra profits to locker-plant operators. This was well established in a survey conducted in Michigan in 1953 by the U. S. Fish and Wildlife Service's Branch of Commercial Fisheries. Locker plants are well adapted for merchandising frozen fishery products because of their supe-

rior cold-storage facilities and steady customer traffic. These two factors alone enable the locker-plant operator to become an important distributor of frozen fishery products in his locality. This is especially true in towns with a population of 5,000 or less since there are usually no frozen-food distributors or wholesale fish markets located in such towns with ideal zero temperatures for storing frozen fishery products and bulk storage space for holding fairly large stocks of frozen fish. On the other hand, locker plants are able to buy and sell in quantity and serve as wholesale distributors to restaurants, hospitals, school-lunch programs, and small grocery stores.



SURVEY METHODS

The entrance of a locker plant in Eaton Rapids, Mich,

During the summer and fall of 1953, 163 Intentrative a locker plants were interviewed in Michigan by a fishery marketing specialist of the Service's Branch of Commercial Fisheries. The following questions were asked each locker-plant manager:

- 1. Are fishery products being sold in the plant?
- 2. What is the monthly volume of sales?
- 3. What varieties are handled?
- 4. How many lockers are rented in the plant?
- 5. What kind of advertising is being done with regard to fishery products?

SUGGESTIONS FOR INCREASING LOCKER-PLANT SALES

The main purpose of this survey was to determine which locker plants in Michigan required ideas, suggestions, and assistance in increasing their sales of fishery products. From the answers to the various questions asked each locker-plant operator as well as a visual inspection of the locker plant, the fishery marketing specialist was able to make certain recommendations which would enable the operator to increase his sales of frozen fish and shellfish and thereby increase the profits of his locker-plant business. Frequently the main ideas and suggestions offered to the locker-plant operator were: (1) improvement of display in the frozen-food cabinet, (2) better location of the frozen-food cabinet for customer traffic, (3) the use of attractive window signs, (4) advertising specials on certain fish and shellfish, *Fishery Marketing Specialist, Educational and Market Development Section, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C.

(5) increasing the number of varieties handled, (6) advertising in local newspapers, (7) the distribution of fish recipes to locker customers, and (8) active promotion by word of mouth by the locker operator when talking to his customers. Fish recipe booklets were distributed to a number of the operators as well as information on proper methods of handling fishery products.

SURVEY FINDINGS

The actual survey revealed that 129 locker plants out of the 163 plants contacted were handling fishery products. Only 40 of these plants were selling 100 pounds or



A Lansing (Mich.) locker plant's frozen-food display case, in which frozen scallops and ocean perch fillets are displayed.

over of fish and shellfish a month. Fishery products were being sold both wholesale and retail by only 24 plants. The rest of the plants sold to the retail trade only. Less than half of the operators interviewed were selling fish to their regular locker-plant customers, and the operators of these plants estimated that less than one third of their locker customers were being sold fish. Of the plants called on, 16 were handling or selling fishery products for school-lunch programs. Principal wholesale outlets for fishery products were hotels and restaurants. Fresh fish as well as frozen fish were being handled in only 13 locker plants. The main

varieties sold fresh were whitefish, lake trout, herring, smelt, and yellow perch.

A monthly comparison of the volume of sales of different groups of locker plants employing different sales practices revealed the reasons for the low fish sales in so many of the locker plants. It is interesting to note that the average monthly quantity of fish and shellfish sold by the 24 plants catering to both the wholesale and retail trade was 258 pounds as compared to 60 pounds a month for the 105 plants selling to the retail trade only. Locker plants offering over 5 varieties of fish and shellfish for sale sold an average of 190 pounds of fishery products a month as compared to an average of 51 pounds a month for locker plants offering 2 and 3 varieties only. Other factors strongly influencing fish sales were found to be the use of a frozen-food cabinet for displaying fishery products, the proper arrangement of fishery products in the display box, the use of fish signs attractively displayed, and the amount of effort and enthusiasm on the part of the locker-plant operator.

Most of the plants handling fishery products had some type of cabinet for displaying or holding frozen fish and shellfish. Some of these cabinets were not well located with regard to customer traffic in the plant. The ideal location for the cabinet is near the entrace of the locker plant where customers are normally entering the plant. The cabinet should also be located so as to be plainly visible to the customers. A number of the frozen food cabinets had poorly-arranged displays of frozen fish and shellfish. In some cases fish packages were completely covered by other items, such as frozen fruits and vegetables displayed in the same cabinet. Each variety of fish should be displayed in full view of the customers. In some cases the size of the cabinet does not allow sufficient space for individual variety display. To overcome this handicap, dummy cartons could be used to advertise the available fishery products. The use of attractive window signs or an attractive sign on top of or near the cabinet would also be a sales aid. Very few of the plants visited displayed attractive fish signs. Many of the plants had only one sign advertising fishery products. This was usually a small sign donated by a frozen food distributor and was usually located on top of the frozen food cabinet. Several plants advertised fresh and frozen varieties of fish with both attractive window signs and signs located at the entrance to the frozen food lockers. Each of these plants were among those with the largest volume of fish sales.

Perhaps the largest single factor influencing the volume of frozen fish sales was found to be the attitude and effort of the locker-plant operator himself. Many plant managers were not actively trying to sell the fishery products available in their plants. A number of locker-plant managers when asked why fish was not being sold to locker customers replied that their customers never ask for fish. These managers apparently overlooked the fact that a number of these same customers could be sold fishery products if they, the managers, would actively promote their product by word of mouth to their customers. In other words, let their customers know that they have fish for sale and try to encourage customers to buy their fish from the locker plant.

Some operators were found to possess very little knowledge of fishery products and seemed to have the idea that handling any type of fish would involve much extra work on their part. Many of these operators had little knowledge of frozen fillets and were thinking mainly of such problems as cleaning and dressing fish in the round. Actually, handling of frozen fish and shellfish would involve no such problem, and the facilities of locker plants provide ideal conditions for the handling of fishery products.

One other reason that may account for low fish sales in a number of locker plants throughout the State is the presence of a number of inland lakes in Michigan which afford an opportunity for many locker customers to catch enough fish for their own use. This was one of the most frequent reasons given by locker-plant managers when asked why fish was not being sold to locker-plant customers. This was especially true in areas where locker plants were located near lakes.

CONCLUSIONS

Frozen fish and shellfish sales by locker plants in Michigan as indicated by this survey are, in general, very low. Only a few of the plants surveyed were doing an active job of selling fishery products. These few plants, which were handling fishery products in quantity and catering to both the wholesale and retail trade, had succeeded in building up a good business through good advertising methods and active promotion on the part of the manager. The testimony of these locker-plant operators that there are good profits to be realized by plant operators who are willing to handle and actively promote fishery products in their plant should serve as a challenge to others in the locker-plant business.



PRECANNING STORAGE OF RAW AND COOKED SPINY LOBSTERS

Experiments on the precanning storage of whole raw and cooked spiny lobsters and lobster tails at room temperature and at 32° F. (0° C.) have shown that the raw meat kept better than the cooked meat. Tails alone kept better than whole spiny lobsters. All samples kept well for 18 hours both at room temperature and at 32° F, but the raw tails withstood storage at 32° F, for 48 hours. Precooked tails in the shell stored for 1 to 2 days in twice their weight of sea water, mixed with the same weight of ice, lost their flavor and texture and were unsatisfactory.

--Official Bulletin of the South African Fishing Industry Research Institute, No. 23.



FISH OILS IN SPRAYS FOR CITRUS TREES

Various fish-oil formulations as fungicides in spraying citrus trees are being tested at Florida Southern College, Lakeland, by Drs. Boris Sokoloff and Isador Chamelin working on a U. S. Fish and Wildlife Service contract with funds provided by the Saltonstall-Kennedy Act.

An unexpected development was the effectiveness of their material as a control of a nematode (a round worm) infecting citrus trees in laboratory experiments. Nematodes are a serious menace to citrus growers in Florida. The intense local interest by orchard men to a preliminary statement of the findings at a local scientific meeting led to some unwarranted optimistic newspaper interpretations of this report.

Although convinced that their formulations may prove of considerable value, these investigators wish to re-emphasize that a large amount of field testing will be required to properly evaluate those formulae found effective in the laboratory tests. In the case of nematode control, this may be time-consuming since the nematodes are found widely and deeply distributed in the soil, and conditions of the application and possible toxicity to trees will have to be studied very carefully.



MID-WINTER STATUS OF SOUTHERN OYSTER RESEARCH

The most important new phase of the study on Southern oysters at Florida State University in Tallahassee by Dr. Betty Watts and staff may be the use of the thiobarbituric acid test as a means of objectively judging storage quality of frozen oysters. Intensive studies are also being made of variations in vitamin content due to season and water conditions, irradiation with radioactive Cobalt 60 to preserve oysters with minimum changes in texture and flavor, and changes in oysters during iced storage.

The generally poor quality of Louisiana oysters this fall and early winter has delayed the preparation of new frozen packs by Dr. E. A. Fieger and staff at Louisiana State University. The first lot was processed on January 20, 1956, in New Orleans, and a second lot was to be prepared for storage from Alabama oysters on January 24. The oysters frozen in May 1955 were still in good condition except for one lot which had been overwrapped but not glazed. These showed surface oxidation and discoloration at 6 months.

At Tulane University, New Orleans, Dr. Milton Fingerman is continuing his research on the effect of stress factors, such as elevated temperatures (104 to 113 F.), on fluid balance of live oysters. He is also investigating the causes of the brownish discoloration frequently observed in Southern oysters. So far none of the changes in environment have had much effect on color intensity.



UTILIZATION OF SEA LIONS STUDIED

The possibility of commercially utilizing sea lions is being studied at the Fishery Products Laboratory, Ketchikan, Alaska. These large marine mammals are considered as annoying predators by certain segments of the fishing industry in Alaska. The extent of depredation caused by this mammal has not been established.

Rookeries where small herds of sea lions haul out during the breeding season are scattered along the coast of Southeastern Alaska. Larger rookeries are lo-



Hide and blubber removed from a 650-pound sea lion.

cated along the Central Alaska coast and the Aleutian Chain. Under certain conditions existing cold storage and reduction plants might find processing sea lions commercially attractive.

Yield data collected during the month of December 1955 indicate that one-third of the sea-lion carcass is dark meat. This meat might find a market as a fur-animal or fish-hatchery feed, competing with horse or whale meat.

Proximate analyses indicate that 22 percent of the sea lion is oil. Studies of oil samples produced at the Ketchikan Laboratory indicate that sea-lion oil and furseal oil are very similar. The market price of fur-seal oil follows closely the market price of

fish oils but, because of a specialized market, some years fur-seal oil brings a premium of one or two cents a pound. This premium price might also apply to sealion oil and might be an inducement for its preparation. The remainder of the carcass consists of viscera, bone, and hide which conceivably could be converted to commercial byproducts.

Note: Also see Commercial Fisheries Review, January 1956, p. 5



INTERIM FEDERAL SPECIFICATION FOR CANNED CRAB MEAT

The Interim Federal Specification for canned crab meat (PP-C-00651a) was issued January 9, 1956, by the U.S. General Services Administration (GSA). It was developed by the U.S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces. It is authorized as a valid waiver to Federal Specification PP-C-651 for use by all Federal agencies for the purchase of the product. It will be converted to a Federal specification after further coordination.

Copies of the Interim specification were sent to the National Fisheries Institute and the National Canners Association for distribution to industry for comment. Additional copies may be obtained from the Technological Section, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C., or from the Fishery Technological Laboratory, U. S. Fish and Wildlife Service, 61 Sumner Street, East Boston, Mass.

Industry comments on the specification are solicited. These may be sent to either of the Service offices mentioned in the preceding paragraph. Comments are to be received in these offices by March 15, 1956, to be considered in the final draft of the Federal Specification. Comments received after that date may be considered only in an amendment or revision of the basic specification.



HALIBUT STEAKS

Halibut steaks are plentiful and moderately priced this fall. Halibut is delicious, and the frozen steaks are ready for your broiler or oven--



no waste, no preparation, just thawing and seasoning. Baking or broiling are the favorite ways to cook this lean white fish.

The halibut is a giant flounder of the northern seas. In Pacific waters, halibut reach weights of 150 to 200 pounds and a length of over four feet. Atlantic Coast halibut commonly grow to be 300 to 450 pounds and have been known to reach 700 pounds.

Here is a favorite tested recipe of the U. S. Fish and Wildlife Service home economists.

BROILED HALIBUT STEAKS WITH CHEESE

2 POUNDS HALIBUT STEAKS 1 TEASPOON SALT DASH PEPPER 1 CUP BUTTER OR OTHER FAT, MELTED 6 THIN SLICES CHEESE

Cut fish into serving-size portions. Sprinkle both sides with salt and pepper. Place fish on a preheated greased broiler pan about two inches from the heat and brush with butter. Broil 5 to 8 minutes or until slightly brown. Baste with butter and turn carefully. Brush other side with butter and broil 5 to 8 minutes more or until fish flakes easily when tested with a fork. Cover fish with cheese and broil until cheese melts. Garnish and serve immediately. Serves 6.

is located,



Additions to U.S. Fleet of Fishing Vessels

DECEMBER 1955: In December 1955 a total of 16 vessels of 5 net tons and over were issued first documents as fishing craft, according to the Bureau of Customs. This was 7 vessels less than in the corresponding month of 1954.

During December, the Gulf area led with 6 newly-documented fishing vessels, followed by the Pacific area with 5, the Chesapeake area with 3, and the South Atlantic States and the Virgin Islands with 1 each.

YEAR 1955: A total of 418 vessels was documented for the first time as fishing craft during 1955, compared with 717 during 1954 -- a decrease of 42 percent. The greatest decline in newly-documented fishing craft during 1955 occurred in the South Atlantic and Gulf areas where the decreases amounted to 45 percent and 67 percent, respectively. These declines were primarily due to a reduction in the number of newly-documented craft entering the shrimp fishery.

Table 1 - U. S.	Vessel	s Iss	ued F	irst I	Docur	nents	Table	2 - U. S	. Vesse	s Issued
as Fishing Craft, December 1955 and Year 1955							First Documents as Fishing			
with Comparisons								Craft,	1938-55	<u>. </u>
	December Annual Totals									37
Area	1955	1954			1953		Year	Number	Year	Number
	(Number)									
New England	-	1	18	23	20	30	1955	418	1946	1,085
Middle Atlantic	-	-	13	15	19	26	1954	717	1945	741
Chesapeake	3	2	54	93	83	65	1953	729	1944	635
South Atlantic .	1	5	65	119	116	89	1952	675	1943	358
Gulf	6	7	103	313	264	161	1951	780	1942	358
Pacific	5	6	117	117	164	203	1950	812	1941	354
Great Lakes	-	1	9	6	7	13	1949	1,002	1940	320
Alaska	-	1	35	27	53	88	1948	1,184	19391/	35 7
Hawaii	-	-	3	1	3	-	1947	1,300	1938-1	376
Puerto Rico	-	-	-	2	-	-	1/ Data	partly estimat	ed.	
Virgin Islands .	1	-	. 1	-	-	-	-		1.0	
Unknown	_	_	-	1	_	-		ouring the		
Total	16	23	418	717	729	675		-1955), 1		
Note: A vessel is assign	Note: A vessel is assigned to the area in which its registered home port							d first do	cuments	as 11Sh1r

ear period vessels were nts as fishing craft. Between 1946 and 1949 inclusive, 4,571 fishing vessels

were documented for the first time--37 percent of the 18-year total. Most of these vessels were registered in the South Atlantic and Gulf areas, which reflected the very large expansion of the shrimp fishery that took place immediately following World War II. Following this expansion brought on by the increased popularity of shrimp, the number of newly-documented craft entering the fisheries has steadily declined each year to approximately prewar levels.



Atlantic Coast Blue Crab Research Objectivies Defined

The erratic fluctuations in commercial abundance of crabs cause widespread marketing difficulties for crabs and crab products. The scarcity of blue crabs dur-

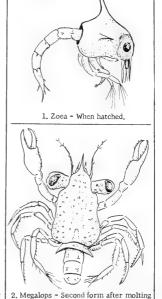
ing the early part of 1955 focused attention on the serious declines that are detrimental to the crabfisherv.

To meet this challenge, a joint meeting of the Chesapeake and South Atlantic Sections of the Atlantic States Marine Fisheries Commission was called to provide for collective thinking on a coastwise research program on the abundance of stocks of blue crabs.

The primary objective of the program is to provide the industry, indirectly, with the highest stable level of production we can achieve without endangering future crops. The primary questions to be answered deal with hatching, recruitment, mortality, as they effect the abundance of the blue crab resource. Long-range measures of hatch can include: (1) the number of eggs produced by each spawner; (2) the abundance of spawners required to continue the population; (3) numbers of young and larval stages.

Recruitment is the addition of crabs to the fishery from a maturing year-class or by immigration of adults into the fishery from another area. It can also be measured by obtaining good catch records of the peeler-crab scrape fishery so that an estimate might be made of a relative year-class strength. Abundance is best indicated by calculating the average number of crabs a man catches per day, or possibly by estimating the size of the population through tagging. There are many factors that affect the mortality of crabs from the egg through the adult stages.

2. Megalops - Second form after molting from the zoeal stage.



Blue Crab

Natural mortality, which is difficult to measure, and fishing mortality, which is more easily estimated, constitute the major means of reducing population.

The Committee concerned with blue crab research is composed of industry members and representatives from federal and state fishery agencies from Delaware to Florida. Both Maryland and Virginia will continue to carry on a major share of the program in the Chesapeake Bay area where the crab is of such great importance, reports the Maryland Tidewater News, a publication of Maryland's Department of Research and Education.



California

PELAGIC FISH DISTRIBUTION AND BEHAVIOR STUDY STARTED (Airplane Spotting Flight 56-1): The first of a series of periodic flights designed to study pelagic fish distribution and behavior in 1956 took place January 17-19. The California Department of Fish and Game Cessna "170" 1359D was used for the airplane spotting.

No fish schools were observed in the area between Monterey and San Francisco on January 17, and none were seen in the area between Monterey and Santa Barbara on the 18th.

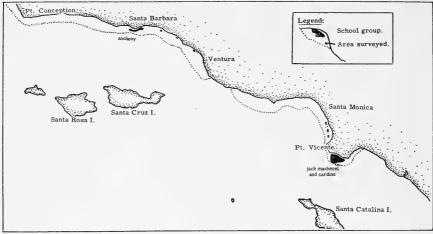


Fig. 1 - Airplane Spotting Flight 56-1, January 18, 1956,

One school group of anchovies was sighted near Santa Barbara on the 18th where 40 schools were counted over a distance of about eight miles along the beach. All

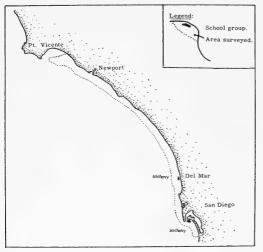


Fig. 2 - Airplane Spotting Flight 56-1, January 19, 1956,

the fish in this area were within mile of the shoreline. Baitboat operators working in this area reported these schools to be of small anchovies 4 to 5 inches in total length. Smaller groups of anchovies were also observed in the Santa Monica, Del Mar, and San Diego areas.

One school group of mixed sardines and small jack mackerel was sighted between Pt. Vicente and Pt. Fermin. Good coverage of this school group was not possible due to the thick haze present in the atmosphere. These mixed schools were very deep in the water and could not be identified from the air, but fortunately the commercial fleet was working the area during the previous night and samples of these fish were observed.

A total of 42 basking sharks were sighted in the area between Santa Barbara and Ventura and 14 California gray whales were sighted from Montery Bay to San Diego.



Conservation Award to Power Company for Development of a Shad Fishway

Secretary of the Interior Douglas McKay announced February 1 that a Department of the Interior's Conservation Service Award was to be made to the Holyoke Water Power Company, of Holyoke, Mass., "in recognition of its outstanding service in the field of conservation of natural resources."

The award is based upon six years of persistent efforts by the Holyoke Water Power Company to develop and construct a workable fish passage facility for shad at the South Hadley Falls Dam on the Connecticut River.

As the result of the Company's interest in conservation, this newly-developed fishway has succeeded in reopening a fishery which has been closed for more than a century. Both sport and commercial fishermen are expected to benefit from the reestablishment of the shad fishery in that area.

John L. Farley, Director of the Fish and Wildlife Service, presented the award to Robert E. Barrett, Jr., President of the Holyoke Water Power Company, at the annual dinner of Wildlife Conservation, Inc., on February 3, in John Hancock Hall, Boston, Mass.

In cooperation with the Fish and Wildlife Service, the Holyoke Water Power Company has worked since 1949 to seek a satisfactory solution to the problem of shad passage at the Company's South Hadley Falls Dam. The difficulties encountered in attempting to pass shad over the dam were well known to the company since two earlier fishways which it had constructed on the site in 1873 and 1940 had failed in their purpose.

The Connecticut River had salmon and shad in tremendous numbers in the 18th century. The Indians used the shad and the white men took the salmon. Salmon fishing ended about 1800 when a dam was erected. Salmon do not return to their spawning grounds if they are denied access to it for one generation. Shad, however, do return and after the dam was removed several years later they again used the upper reaches of the river for spawning, and shad fishing soon became a big business.

But, as the years passed, industrialization along the North Atlantic coastal rivers resulted in water pollution and the erection of dams which restricted the passage of migratory fish. Conservationists freely predicted the end of a great natural resource. Fish ladders were built consisting of a series of ascending pools in the form of watery staircases, but the shad did not use them. Variations of the ladders were tried without success.

In 1949, under the terms of a license issued by the Federal Power Commission for the erection of a hydroelectric station at the dam, the Holyoke Water Power Company agreed to provide satisfactory fish-passage facilities at their dam.

To achieve a fully functional fishway device, the Company decided to base their studies upon the habits and peculiarities of the shad. A Company engineer was assigned to work closely with Service representatives. In December 1949 this engineer was sent to the West Coast, at company expense, to study fish-passage facilities in that region.

During the summer of 1950, the Company participated in fishway model studies conducted at the Alden Hydraulic Laboratory of Worcester Polytechnic Institute in Worcester, Mass. This study was established to make determinations on the hydraulic conditions which would prevail at the fishway and to test the reactions of fish to these conditions.

In 1952 a new fishway began operation. Although certain features operated most successfully, the fishway failed to pass many shad during its first three years of operation.

At this point the Company had more than performed the obligations imposed by the terms of the Federal Power Commission license. But, in the interests of conservation, the Company decided to continue its efforts to produce a more satisfactory fish-passage device.

During the spring of 1955, Company officials designed and installed a new automatic hopper device. This device proved to be successful and nearly 5,000 shad were lifted over the Holyoke Dam. For the first time in 107 years, considerable numbers of shad reached their ancestral spawning grounds.

In recognition of this significant accomplishment, Fish and Wildlife Service officials nominated the Holyoke Water Power Company for the Department's Conservation Service Award.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE, DECEMBER 1955: For the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force, the Army Quartermaster Corps in December 1955 purchased fresh and frozen fishery products amounting to 1.8 million pounds,

valued at \$897, 308 (see table). This was a decrease of 8.3 percent in quantity, but an increase of 4.5 percent in value as compared with November 1955. Compared with December 1954, the purchases in December 1955 were 10.9 percent less in quantity, but 10.1 percent greater in value. The higher value and the

Purchases of Freshand Frozen Fishery Products
by Department of Defense (December and 12
Months of 1955 with Comparisons
OUANTITY
VALUE

	QUAN'	TITY		VALUE .			
Dece:	mber	JanDec.	Dece	mber	JanDec.		
1955	1954	1955 1954	1955	1954	1955 1954		
. (Mil	lions o	of Pounds) .	(Millions of \$)				
1.8	2.0	25.0 25.3	0,9	0.8	10.9 10.4		

smaller quantity indicates that higher-priced products were purchased in December 1955 than in the previous month and the same month a year earler.

Quartermaster Corps purchases of fresh and frozen fishery products for the year 1955 totaled slightly less than 25.0 million pounds (valued at \$10.9 million), 1.2 percent less in quantity, but 5.1 percent higher in value than for 1954.

Prices paid for fresh and frozen fishery products paid by the Quartermaster Corps in December 1955 averaged 50.2 cents a pound as compared with 40.6 cents a pound in the same month in 1954. The 1955 average annual price for all fresh and frozen fishery products purchased was 43.7 cents a pound as compared with the 1954 annual average price of 41.1 cents a pound.

In addition to the purchases of fresh and frozen fishery products indicated, the Armed Forces generally make some local purchases which are not included in the data given above. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.

Florida

UNIVERSITY ORGANIZES CLUB TO TEACH COMMERCIAL FISHING TO BOYS: The Director of the Marine Laboratory, University of Miami, reports the organization of a club at Fort Myers, Fla., to teach high school boys the trade of fishing. This will be on the order of the 4H clubs among farm boys and will teach fishing, net mending, navigation, boat handling, technology, area to fish, accounting, etc. According to present plans the club will be run by a coordinator from the University who will work in his spare time along with a volunteer worker at Ft. Myers. If successful, the effort will be expanded to other areas in Florida. An expenditure of \$1,000 has been authorized to get the club started. This is for the purchase of equipment and no salaries will be paid. Continuation of the program past the first year and its expansion to other areas will depend upon the raising of funds.

There has long been a need to teach American youth the principles of fishing and to encourage them in making fishing a career.



Great Lakes Fishery Investigations

<u>SEA LAMPREY POISON SEARCH NEARS</u> <u>CLOSE</u>: The search for a poison which can kill larvae of sea lampreys without injuring desirable species of fish is drawing toward a successful conclusion, but additional testing must be made before a definite statement of success can be made.

The poison, specific to lampreys and harmless to other fish, will be used in connection with electrical devices which have already been proved and have been installed at various points in the Great Lakes in a double-barreled attack on the parasitic sea lamprey which has moved into the Great Lakes with such disastrous results to commercial fishing.

The electrical devices block the lamprey from ascending to spawning grounds in the tributaries of the lakes. The poison, if it lives up to expectations, will kill the five generations of lamprey larvae which live in the mud bottoms of the streams. Adult lampreys, attempting to reach spawning grounds, will be killed by the electrical devices.

About 5,000 poisons have been tested in the search for one which is specific for lampreys. Several poisons have been found which give excellent results in many tests in which lamprey larvae and fish have been treated under identical laboratory conditions. These selective poisons are undergoing extensive testing before field trials to make doubly sure that they will not be harmful to desirable fish, to game, or to man in concentrations at which they will kill lamprey larvae.

All United States streams tributary to Lake Superior known to have lamprey spawning areas have been blocked by the electrical devices. Canada is well along on its part of the program and will have the task completed in 1957. At present there are 72 electrical barriers operating on Lake Superior.

Lake Michigan fishing has already been disastrously hit by the sea lamprey. Recent test gill-netting indicated that lake trout have practically been eliminated in that body of water since the influx of sea lamprey a few years ago.

During the search for a lamprey poison the U.S. Fish and Wildlife Service uncovered many promising leads for the development of other selective fish poisons which can be used in fish management. It is expected that additional work along this line will open up some entirely new approaches to fish population control.

Gulf Exploratory Fishery Program

SMALL CATCH OF TUNA REPORTED BY "OREGON" ON 27-DAY TRIP (Cruise 35): Generally poor fishing was reported during a 27-day exploratory tuna cruise (January 1956) through the north central Caribbean and central Gulf of Mexico by the Service's exploratory fishing vessel Oregon. Four 100-basket (1,000 hooks)

Location of long-line stations (X) fished during Cruise 35 by the $\underline{\text{Oregon.}}$

and seven 50-basket (500 hooks) stations were fished. Heavy seas restricted the amount of gear that could be set at several stations. The total catch yielded 29 yellow-fin tuna weighing 3,654 pounds (average of 126 pounds per fish) and 19 albacore weighing 969 pounds (average 51 pounds per fish). Catch rates for these two species varied from 0 to 1,8 fish per 100 hooks and averaged 0.6 per 100 hooks. One yellowfin was shark bitten.

All live yellowfin (16), blue marlin (3), and white marlin (3) were tagged and released in cooperation with the Woods Hole Oceanographic Institution. In addition, 1 skipjack, 2 broadbill

dition, 1 skipjack, 2 broadbill swordfish, 3 spearfish, 6 blue marlin, 5 white marlin, 22 white-tip and silk sharks, 9 dolphin, and one 353-pound bluefin tuna were caught, the latter in the north central Gulf. The albacore were all caught east of Jamaica. Catch rates for all species were very low from west of Jamaica to the central Gulf.

Prior to fishing operations, 21 tons of yellowfin tuna caught by the <u>Oregon</u> last August were delivered to Ponce, Puerto Rico, for canning. Approximately $6\frac{1}{2}$ tons were rejected as off-color and unsuitable for a commercial pack.

A port call was made at San Juan, ${\bf P.}$ R., on January 19 for repairs to the long-line hauler.

The $\underline{\text{Oregon}}$ started on this cruise on January 5, 1956, from Pascagoula, Miss., and the vessel returned to that port early in February.

The <u>Oregon</u> was scheduled to depart from Pascagoula on February 15 to conduct two weeks of commercial-scale trawling for deep-water red shrimp off the coasts of Mississippi, Alabama, and western Florida. Night-time trawling in the 200- to 250-fathom depth range in this area last fall yielded catch rates of up to 770 pounds per night, using 74-foot balloon trawls.



Maine

CANNED MAINE SARDINE STOCKS, JANUARY 1, 1956: Distributors' stocks of Maine sardines amounted to 326,000 actual cases as of January 1, 1956, a decrease of 28,000 cases since November 1, 1955, when they were last measured. Comparable data for a year earlier are not available.

Canners' stocks amounted to 475,000 standard cases (100- $3\frac{1}{4}$ oz. cans) on January 1, 1956, according to estimates based on the results of the second in a series of five measurements for the 1955/56 marketing season by the U. S. Bureau of Cen-

sus. Canners' stocks on January 1, 1955, as reported by the Maine Sardine Industry, were 1,239,000 standard cases. Canners' stocks on January 1 this year were 62 percent less than on the same date in 1955, which reflects the lighter pack in 1955. From November 1, 1955, to January 1, 1956, canners' stocks dropped 150,000 standard cases.

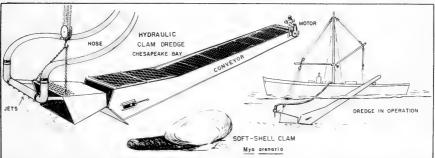
Maine SardinesWholesale Distributors' and Canners' Stocks, January 1, 1956, with Comparisons									
Type of Unit 1955/56 Season 1954/55 Season									
Stocks	Onn	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54	
Distributors	1,000 actual cases	326	354	235	n.a.	331	n.a.	n.a.	
Canners	1,000 actual cases	475	625	723	5 7 5	715	1,239	1,410	
n.a Not available.									

The total available canners' supply (carryover plus pack) for the 1955/56 season was 1,945,000 standard cases as compared with the previous season's supply of 2,875,000 cases. Shipments from April 15, 1955, to January 1, 1956, totaled 1,470,000 standard cases as compared with 1,636,000 cases for the same period a year earlier.



Maryland

NEW SOFT CLAM INDUSTRY AND RESEARCH PROGRAM: The Fishery: Maryland's Chesapeake Bay fishery for soft clams (Mya arenaria) has grown steadily since development of the hydraulic clam dredge, according to the December 1955 Maryland Tidewater News, a publication of the State's Department of Research and Education. During 1950-54 the number of licensed dredgers increased from 1 to 33. Since enactment of legislation regulating the fishery, effective June 1, 1955, the number of dredge boats licensed in Queen Anne's, Talbot, and Calvert Counties



has increased from 48 to 77. Concurrent legislation prohibited use of the hydraulic dredge in the counties of Anne Arundel, Dorchester, Wicomico, Somerset, and St. Mary's several of which are believed to have clam populations of potential commercial importance.

Current production is estimated at from 10,000 to 15,000 bushels a month, worth from \$4 to \$6 a bushel to the dredgers and averaging about \$8 a bushel in

the wholesale markets of New York and New England. The product is handled by 23 licensed dealers, of whom 6 are from Massachusetts, 3 from New Jersey, and 1 each from New York, Rhode Island, Connecticut, and Maine. Of the ten Maryland dealers, only one shucks clams, the others acting chiefly as reshippers, since local demand for the product is almost negligible. The gross annual value of the fishery is estimated at about \$1,250,000. Capital investment exceeds \$350,000.

Research Program: Expansion of the industry has been accompanied by a great deal of controversy concerning the effects of hydraulic dredging on resources of economic importance. Unfortunately, very little was or is known of the biology of the soft-shell clam in Maryland waters, and prediction of the effects of a new gear can only be conjectural. The Department of Research and Education began a limited program of investigation in 1954, some results of which have already been published. It has been demonstrated that soft clams grow very rapidly in Maryland, reaching the legal minimum length of two inches in 18 months or less, and that the life cycle is much shorter than that of the same species in New England. The breakage rate in harvesting with the hydraulic dredge has been shown to be less than 25 percent of that associated with hand digging. Something has been learned of the distribution and abundance of the species, the time of spawning and setting, and factors of natural mortality.

With the tax-supported research fund established by the legislature in 1955 and now available to the Department, the research program is being expanded. First priority is given to a study of the effects of hydraulic dredging on the physical structure of the bottom and the productivity of shoal areas in terms of sedentary animals and suitability as a habitat for water fowl, forage fish, and crustaceans. Studies of distribution and abundance, replacement potential, annual cycle of condition, and the effects of temperature, salinity, and turbidity on pumping rates of the clam are in progress. An attempt is being made to set up a statistical program for the fishery.

The research program is designed to provide answers to the most urgent questions that have been asked by management authorities, groups having financial interests in other estuarine resources, sportsmen's organizations, and public health agencies. Time is required for reaching the objectives of such investigations. However, it is believed likely that management of the soft-shell clam industry will be based on the results of research,



Pacific Oceanic Fishery Investigations

ABUNDANCE AND DISTRIBUTION OF EQUATORIAL TUNA IN THE PACIFIC, 1954-55: A completed analysis of 1954 experimental and commercial fishing in the equatorial Pacific by the Service's Pacific Oceanic Fisheries Investigations shows that the availability of yellowfin tuna was considerably lower than in previous years. The higher catches expected during July through September 1954 on the basis of past experience did not materialize.

Brief analyses of the 1954 records from the Christmas Island station show that water much colder than normal was coincident with this period of poor fishing and that early in 1954 when fishing was good the water temperatures were approximately normal. It is probable that these changes in temperature are associated with the vigor of the equatorial upwelling system. It is assumed that very cold water is the result of strong upwelling and that this water has not been in the mixing zone long enough to develop a population of tuna-forage organisms. Thus the cold water cannot support a strikingly large population of tuna.

The year-round sampling program, begun in March 1955 to describe the population changes during a year in the Line Islands region, was continued. The abundance of tuna in 1955 continued to be as low as it was during the last part of 1954, and along with this relatively poor fishing in 1955 the water is strikingly cold, at least when compared to temperatures that prevailed during the period 1950-54. In fact, during December 1955, temperatures as low as 75° F, were encountered in a region that is typically 78°-82° F. Incidental to the sampling program, 900 yellowfin tuna were tagged and released.

* * * * *

TAGGED TUNA RECOVERIES INDICATE EXTENSIVE MIGRATION AND RAPID GROWTH: Two recent recoveries of tagged tuna, one an albacore and the other a skipjack (aku), have contributed materially towards the understanding of the migration and growth of these fish, according to a February 6 news release by the Service's Pacific Oceanic Fishery Investigations.

An albacore which was tagged by the Investigations' research vessel, the John R. Manning, on October 5, 1954, at a point 1,300 miles north of the Hawaiian Islands was recaptured by Japanese fishermen in the coastal waters of Japan. After 471 days of freedom the albacore, bearing a plastic tube tag which has the appearance of a piece of spaghetti, was recaptured on January 19, 1956, about 75 miles northeast of the entrance to Tokyo Bay. The fishermen immediately noticed the white "spaghetti" tag on the fish's back and returned it together with the length of the fish to the Honolulu laboratory.

This albacore was retaken at a point 2,670 miles from the point of release, but, of course, the exact pattern of migration between these two points is not known. Nevertheless, this recovery is added evidence that the albacore in the North Pacific belong to one single population which makes extensive trans-Pacific migrations between the west coast of America and Japan. The Japanese have also recovered at least four albacore which were tagged on the West Coast by the California Department of Fish and Game. The albacore is a valuable fish for canning and is fished by both Japanese and United States fishermen on the two coasts, as well as in mid-ocean.

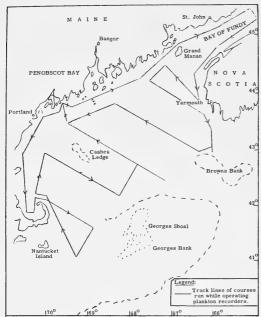
This latest recovery also gave direct evidence on the rate of growth of the albacore. When tagged, the fish weighed 15 pounds and at recapture, it had grown to at least 40 pounds. The exact weight will be determined after the laboratory receives word from Japan regarding the manner in which the fish was measured when it was retaken.

In Hawaiian waters a skipjack (aku), after carrying its tag around for 252 days, was recaptured by the sampan Neptune. This was the longest period between release and recapture of any of the aku recoveries thus far. This fish was tagged and released from the fishery research vessel, the Charles H. Gilbert, on May 25, 1955, a few miles off Barbers Point from a school in which the fish averaged 7 pounds in weight. The recaptured fish weighed 14 pounds when retaken on February 1, 1956, a few miles off Makapuu Point, 30 miles from its point of release. The fishermen on the Neptune reported that the fish appeared normal in all respects when captured. This fast rate of growth shows that the "season aku" on which the fishery depends are not very old fish. More long-term recoveries are needed, however, and the fishermen's continued cooperation is solicited by the researchers at the Pacific Oceanic Fishery Investigations laboratory.

Note: See Commercial Fisheries Review, February 1956, p. 25.



North Atlantic Herring Research



Theodore N. Gill, Cruise 10 (1/19-1/28/56).

ANOTHER PLANKTON
SURVEY OF GULF OF MAINE
("THEODORE N. Gill," Cruise
10): A third plankton survey of
the Gulf of Maine and some adjacent waters was made by the
Service's research vessel Theodore N. Gill from January 19
to January 28, 1956. The purpose of this cruise was to further check the numbers and distribution of the developing herring young spawned during the
1955 season.

Two Hardy Continuous
Plankton Samplers were towed
at 9 knots speed, as in Cruises
8 and 9. One sampler was towed
at the surface and the other
10 meters below the surface.
A total of 12 plankton tows was
made at 12-hour intervals with
a one-meter silk-gauze net.
Surface and subsurface temperature records were kept throughout the cruise. A total of 160
bathythermograph casts were
made.

Shrimp Retail Sales Studied

America's penchant for shrimp, as reflected in the over-the-counter sales in the Nation's retail food stores, is portrayed by a study made by the U.S. Fish and

Wildlife Service. This study on shrimp in the retail market is one of several which the Service is making in its comprehensive survey of the shrimp industry, the first such survey ever made in this field.

During the course of the comprehensive survey the Service will examine the potential market for shrimp products, the efficiency of the processing plants, primary marketing methods, work practices in shrimp fishing vessels, cost of vessel operations, and other matters pertaining to the production, preparation, and distribution of shrimp and shrimp products.

A review of the retail sales in August and September 1955 showed that during those months Americans were buying shrimp and shrimp products at the rate of more than 13 million pounds a month. Fresh and bulk-frozen shrimp were most



Fresh shrimp displayed in a retail cabinet,

popular, with consumers buying over the fish counter at the rate of nearly 7 million pounds a month. Packaged frozen shrimp and shrimp products were next in popularity with 5.4 million pounds coming out of the freezer display cabinets into the kitchens of the homes. Canned shrimp was third with monthly sales of 900,000 pounds. The total sales value was approximately \$12 million per month with each class averaging as follows: fresh and bulk-frozen shrimp, \$5.2 million; packaged frozen shrimp and shrimp products, \$5.1 million; canned shrimp, \$1.4 million.

The total retail inventory at that time was only 8 million pounds of shrimp of all classes. Of this 3 million pounds were fresh and bulk-frozen shrimp; 2.1 million pounds of frozen, uncooked; 0.6 million pounds of uncooked breaded; 1.8 million pounds of canned shrimp; 0.3 million pounds of frozen cooked breaded; and 0.2 million pounds of miscellaneous shrimp products.

The retail trade study of the comprehensive survey is being made by the A. C. Nielsen Company of New York and Chicago. It is being done on the basis of a reliable sample of the 413,000 retail food stores in the United States.

The project is financed by funds provided by the Saltonstall-Kennedy Act which was passed in 1954.



U.S. Foreign Trade

EDIBLE FISHERY PRODUCTS, NOVEMBER 1955: United States imports of fresh, frozen, and processed edible fish and shellfish in November 1955 totaled 71.5 mil-

lion pounds (valued at \$20.5 million), according to a Department of Commerce summary tabulation (see table). This was a decrease of 3.8 percent in quantity as compared with October 1955 imports of 74.3 million pounds. The value of the imports for November 1955, however, increased by 11.4 percent over the October 1955 value. The November 1955 imports were higher by 14.4 percent in quantity and 25.8 percent in value than in the same month a year earlier.

Exports of processed edible fish and and shellfish (excluding fresh and frozen) in November 1955 totaled 14.3 million pounds (valued at \$3.3 million)--a

		Quant	ity		Valu	1e	
Item			Year		v.	Year	
	1955	1954	1954	1955	1954	1954	
	(Mill	ions of	Lbs.)	(Mi	lions	of \$)	
Imports: Fish & shellfish: fresh, frozen, & processed 1/	71.5	62.5	801.7	20.5	16,3	202.8	
Exports: Fish & shellfish: processed 1/ only (excluding fresh and frozen) 14,3 5,8 50,8 3,3 1,4 13,2							

sharp increase of over 151 percent in quantity and 106 percent in value as compared with the October 1955 exports of 5.7 million pounds (valued at \$1.6 million). November 1955 exports were higher by 146.6 percent in quantity and 135.7 percent in value than in November 1954.

* * * * *

IMPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-NOVEMBER 1955: There was a large increase in United States imports of canned salmon from Japanthey totaled 2 million pounds in November and and these imports for the first 11 months of 1955 totaled 3.3 million pounds. In October 1955 almost 7.0 million pounds were received; in September, 254,000 pounds. Canned salmon imports from Canada in September-November 1955 totaled 4.6 million pounds as compared with 226,000 pounds in that period a year earlier.

Frozen tuna imports were also above those of a year ago. During the first eleven months of 1955, they totaled 137.4 million pounds, compared with 115.2 million pounds in that period for the previous year. Imports of tuna canned in brine also increased considerably over a year earlier.

A substantial increase was also reported in United States imports of shrimp which totaled 46.2 million pounds during January through November 1955. Shrimp imports during 1955 will reach a record high level.

Fish meal imports were only about two-thirds of those of a year earlier.

* * * * *

IMPORTS OF MEXICAN SHRIMP THROUGH NOGALES, ARIZ., INCREASE: In a complete reversal of recent trends, the Mexican shrimp fishery in the Gulf of Baja California has made a most surprising comeback. During the latter part of 1953 and all of the 1954/55 season this fishery appeared to be declining at an alarming rate. The extent of this decline was noted by the sharp decrease in United States imports from Mexico through Nogales, Ariz., during the 1954/55 season (through January 22), which declined to 9,660,000 pounds, or a decrease of approximately 50 percent as compared with the previous season.

Starting in October 1955 the Mexican shrimp fishery indicated a remarkable recovery, especially in the fishing areas along the east coast of the Gulf of California as far south as Mazatlan. Imports of frozen shrimp to January 22, 1956, cleared through Nogales, Ariz., were more than twice the imports for the same weeks a year earlier. At Nogales, imports of frozen shrimp from September 1, 1955, through January 22, 1956, totaled 20, 439,000 pounds as compared with 8,533,400 pounds during the same period a year earlier.

Reports from importers of west coast Mexican shrimp in Los Angeles and San Diego indicated a very high rate of production in the Topolobampo Bay area. It is understood that catches in this part of the Gulf overtaxed the unloading facilities to the extent that many boats had to wait for two or three days before their shrimp could be unloaded. The size and quality of the shrimp catches has been good, with a heavy percentage of large (20 per pound heads off) white shrimp.

The demand, movement, and prices have been good, due in part to very light catches of shrimp in the Gulf of Mexico.



Wholesale Prices, January 1956

Following the Christmas holiday period, production by the fishing fleets, particularly on the Atlantic Coast and in the Northwest Pacific areas, was slow to pick up due primarily to cold and windy weather. The light catches were reflected in the January 1956 index (122.3 percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) which rose 8.6 percent above that for December 1955 and was 15.7 percent higher than for January 1955.

The increase in the January 1956 index for the drawn, dressed, and whole finfish subgroup was due to price increases for all the items included in this group, with the exception of lake trout prices at Chicago which dropped slightly. Prices for fresh large drawn haddock in January were higher by 67.5 percent when compared with December 1955 and 30.7 percent higher than January 1955. Lake Superior drawn whitefish at Chicago was 30.1 percent higher than in December 1955 and

36.7 percent over January 1955. This subgroup's January 1956 index was up 22.6 percent as compared to December 1955 and 15.8 percent higher than in January 1955.



A box of fluke ready for icing and shipment at the dock of a wholesale plant in Hampton, Va.

The price increases in the fresh processed fish and shellfish subgroup amounted to 7.7 percent when compared with December 1955 and 25.8 percent as compared to January 1955. The increase from December 1955 to January 1956 was due primarily to the high ex-vessel prices for haddock at Boston and a 5-percent increase in the index for fresh headless shrimp at New York. January 1956 prices for both fresh small skin-on haddock and fresh headless shrimp were up 41-42 percent and for fresh shucked oysters 10 percent higher, as compared with January 1955.

of a wholesale plant in Hampton, Va.

The price index for the processed frozen fish and shellfish subgroup changed only slightly (up 2.4 percent) when compared with December 1955. The change between January 1955 and January 1956 was much

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. I	Prices1/			exes 49=100)	
			Jan. 1956	Dec. 1955	Jan. 1956	Dec. 1955	Nov. 1955	Jan. 1955
LL FISH & SHELLFISH (Fresh, Frozen, & Canned)			١		122.3	112.6	112.0	105.7
Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, ige, & med, drsd., fresh or froz. Whitefish, L. Superior, drawn, fresh. Whitefish, L. Erie pound or gill net, rnd., fresh Lake trout, domestic, No. 1, drawn, fresh. Yellow pike, L. Michigan& Huron, rnd., fresh. Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb. tins. Shrimp, ige, (26-30 count), headless, fresh.		lb.	.21 .29 .60 .69 .70 .64 .50	.12 .28 .59 .53 .68 .65 .2/.44	136.5 143.5 208.2 89.2 135.4 171.0 141.5 131.1 117.3 133.7 217.7 118.5 136.1	85,1 133,1 131,4 136,5 132,2 102,0 124,1 132,7 113,4	118,5 119,3 125,7 84,6 133,7 185,9 171,9 132,2 102,0 117,1 122,5 100,5 136,1	111.6 123.9 159.3 85.6 125.6 125.2 143.5 103.5 117.3 106.3 153.1 83.8 123.7
Processed, Frozen (Fish & Shellfish):					117,6	2/114.3	109.7	89,2
Ocean perch, skins on, 1-lb. pkg	Boston Boston Boston Chicago	lb. lb. lb. lb.	.40 .30 .29	.40 .29 .28	104.7 92.6 114.8 121.1	91.0 112.8	104.7 89.5 108.8 110.0	98.2 90.2 111.8 72.5
Canned Fishery Products:	01-		21.70	31.70	102.2 120.0		102.6 114.8	97.2 104.4
Salmon, pink, No.1 tall (16 oz.), 48 can/cs., Tuna, It, meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs Sardines, Calif., tom. pack, No. 1 oval (15 oz.),	Seattle Los Angeles	case	11.80	11.80	85.1	85.1	90.8	93.0
48 cans/cs	Los Angeles New York	case	7.00 8.45	7.00 8.70	81.7 89.9		86.1 87.3	71.

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.
2/ Revised.

sharper due mainly to an increase of 67 percent in frozen shrimp prices from 1955 to 1956.

Price changes for the canned fishery products subgroup were only slight between December 1955 and January 1956, but the increase from January 1955 to January 1956 was close to 5 percent. Prices in January 1956 for canned tuna were down 9.2 percent and canned California sardines 4.1 percent as compared with January 1955, but both canned Maine sardines and canned salmon were up 15.0 percent and 26.1 percent, respectively.



STORAGE LIFE OF PRECOOKED FROZEN FOODS

"What is the storage life of precooked fishery products?" is a question often asked since precooked fish sticks, pies, and dinners have become so popular. The Quartermaster Food and Container Institute for the Armed Forces, Chicago, Ill., has just published a book entitled Precooked Frozen Foods. This book contains numerous papers which were given by leading authorities in the frozen food field at a symposium held recently by the Quartermaster.

One of these papers, "Keeping Quality During Storage of Precooked Frozen Foods," gives an insight into this question. The summary of the paper states:

"Many factors influence the storage life of precooked frozen foods. These include the quality of the initial product, preparation, seasoning ingredients, cooking, packaging, period of storage, and constancy of the storage temperature.

"The storage life of most precooked foods is much shorter than that of the same foods frozen uncooked. This is due largely to the gradual loss of the freshly-cooked aroma and flavor of most seasoned products, during freezing storage, which can be only partially restored by reheating. Other losses in quality are due to changes in seasoning ingredients and rancidity of fats.

"Some precooked foods may be satisfactorily held frozen for more than a year; some of these are stewed and sweetened fruits, fruit cakes, cookies and low-fat and lightly-seasoned beef, or chicken stew. Others, including meats, fish, poultry, and meat-and-vegetables combinations cooked with moist heat and covered with gravy, liquor, or sauce, as well as most cakes and pies, may be held for 6 to 9 months. Most fully-cooked vegetables, fried chicken or fish, barbecued chicken or pork, or doughnuts and other bakery products cooked in deep fat, and leftovers are stable for only a few weeks in freezing storage."



International

TERRITORIAL WATERS

INTER-AMERICAN JURIST COUNCIL PASSES RESOLUTION ON TERRITORIAL WATERS: A resolution to the effect that the three-mile limit is inadequate and not a normal part of international law, and that each state is competent to set its boundaries in territorial seas within reasonable limits was passed on February 1, 1956, at the third assembly of the Inter-American Jurist Council in Mexico City. The vote on the resolution presented by Mexico and eight other Latin American countries was 15 to 1, with only the United States voting against the resolution. Five nations abstained in the final voting. Cuba voted with the United States on some points when the resolution was presented article by article, but abstained in the final vote, according to reports.

The resolution covered more than just territorial waters since it dealt with many aspects of the regime of the seas.

The resolution recognizes as an expression of the juridical conscience of the continent, and as applicable between American States, the following rules, among others.

It declares that acceptance of these principles does not imply and shall not have the effect of renouncing or weakening the position maintained by various countries of America on the question of how far territorial waters should extend.

With reference to territorial waters the resolution states that (1) the distance of three miles as a limit of territorial waters is insufficient, and does not constitute the rule of general international law. Therefore, enlargement of the zone of the sea traditionally called "territorial waters" is justifiable. (2) Each state is competent to establish its territorial waters within reasonable limits, taking into account geographical, geological, and biological factors, as well as the economic needs of its population, its security and defense.

In regard to the continental shelf, the resolution asserts that the rights of a coastal state with respect to the seabed and subsoil of the continental shelf include the right to the natural resources found there, such as petroleum, hydrocarbons, mineral substances, and all marine, animal, and vegetable species that live in constant physical and biological relationship with the shelf, not excluding all benthonic species.

On the question of conservation of living resources of the high seas, the resolution states (1) coastal states, following scientific and technical principles, have the right to adopt measures of conservation and supervision necessary for the protection of the living resources of the sea contiguous to their coasts, beyond territorial waters. Measures that may be taken by a coastal state in such a case shall not prejudice rights derived from international agreements to which it is a part, nor shall they discriminate against foreign fishermen. (2) Coastal states have, in addition, the right of exclusive exploitation of species closely related to the coast,

life of the country, or needs of the coastal population, as in the use of species that develop in territorial waters and subsequently migrate to the high seas, or when existence of certain species has an important relation with an industry or activity essential to the coastal country, or when the latter is carrying out important works that will result in conservation or increase of the species.

There was also a section of the resolution which referred to base lines and pointed out that coastal states may draw straight base lines that do not follow the low-water line when circumstances require this method because the coast is deeply cut or cut into, or because there are islands in its immediate vicinity, or when such a method is justified by the existence of economic interests peculiar to the region or coastal state. In any of these cases the method may be employed of drawing a straight line connecting outermost points of the coast, islands, islets, keys, reefs, shoals, or shoals or banks, whether they rise above the surface intermittently or not. Drawing of such base lines must not depart to any appreciable extent from the general direction of the coast, and the sea areas lying within these lines must be sufficiently linked to land domain. (3) Waters located within the base line shall be subject to the regime of internal waters. (4) The coastal state shall give due publicity to straight base lines.

The part of the resolution dealing with bays states that (1) a bay is a well marked indentation whose penetration inland in proportion to the width of its mouth is such that its waters are inter faucesterrae and constitute something more than a mere curvature of the coast. (2) The line that encloses a bay shall be drawn between its natural geographical entrance points where indentation ceases to have the configuration of the bay. (3) The waters comprised within the bay shall be subject to the juridical regime of internal waters if the surface thereof is equal to or greater than that of the semicircle drawn by using the mouth of the bay as the diameter. (4) If the bay has more than one entrance, this semicircle shall be drawn on the line as long as the sum total of the length of the different entrances. The area of the islands located within the bay shall be included in the total area of the bay. (5) The same rules shall be applicable to estuaries. (6) The so-called "historical" bays may be subject to special regimes established by the coastal state or states.

WHALING

ANTARCTIC WHALING, 1955/56 SEASON: The Antarctic 1955/56 whaling season has had a poor start, preliminary reports from the South Georgia whaling stations indicate. With the total catch this season limited by the International Whaling Commission to 15,000 blue-whale units against 15,500 units last year, Norwegian whaling companies expect their share of the catch will be less than 50 percent.

Prices of whale oil sold early this year have been about 13 percent above the preceding year. If they are maintained at this level, they will help offset the anticipated reduction in the catch.

Japan's three whaling fleets this season make up that Country's biggest postwar whaling expedition. A total of 68 Japanese ships are taking part in the whaling season which opened January 7, 1956. The target set by the Japanese fleet is 850 sperm whales, 48,000 metric tons of whale oil, 42,000 tons of meat from blue and fin whales, and 645 tons of meat from sperm whales.

The reduction by 500 units in the catch quota for Antarctic pelagic whaling would be equivalent to a reduction in whale-oil output of from 10,000 to 12,000 short tons. However, the yield of whale oil per unit was below average in the 1954/55 season. Thus, if yields in the 1955/56 season are more nearly normal, whale-oil production under the new limit could still exceed the 332,000-ton Antarctic pelagic output of 1954/55.

A "blue-whale unit" is the measurement of the quantity of oil extracted, and represents either 1 blue whale or 2 fin whales or $2\frac{1}{2}$ humpbacked whales. Note: Also see Commercial Fisheries Review, September 1955, p. 92.



Australia

TUNA FISHING PROSPECTS TO BE STUDIED: Funds for investigating the possibility of establishing a tuna fishing industry in South Australian waters has been included in budget estimates, the Australian Minister of Agriculture stated in November 1955.

The sum of US\$17,900 has been provided for the purchase of a fishing vessel to be used in the research work and for the catching of live bait. Additional funds of US\$21,300 were provided for a thorough investigation of the tuna fishing possibilities.

Two United States tuna fishing experts will be brought to South Australia and will use another boat based at Port Lincoln.

If the tuna catch is reasonably good, the cost of the project will be recovered, according to the December 1955 issue of <u>Fisheries</u> <u>News Letter</u>, a periodical issued by the Commonwealth Director of Fisheries.



Belgian Congo

FISH IMPORTS: The Belgian Congo's imports of canned herring and canned sardines have been practically monopolized by European suppliers during the past three years, reports the Canadian Foreign Trade of September 17, 1955. An encouraging note, however, was sounded at the outset of 1955 when Canadian sardines reentered the market at prices which bettered those of European suppliers. The African is very fond of canned fish and bought over US\$1.6 million worth during 1954. There appears to be little or no let-up in the demand although stocks of canned fish were quite high in Leopoldville and other large centers late in 1955.

The Congo is also a heavy importer of dried salted fish of varying species—about 23,000 metric tons were imported during 1954 (valued about US\$5.7 million). The principal sources were Angola, the Canary Islands, and South Africa. Because of a controlled retail price of 20 francs per kilo (about US\$0.18 a pound), suppliers of dried salted cod must be prepared to land their fish at Matadi at between 12-13 $\frac{1}{2}$ francs per kilo (about US\$0.12 a pound) in order to make any headway in this colony.



Chile

SHRIMP INDUSTRY: Chile's fishing for shrimp is generally incidental to some other fishery. However, now and then some experimental hauls may be made. Some consideration is being given to fishing for shrimp in deep waters (200 to 500 fathoms).

There are at least three, and probably more species of shrimp not yet identified, that can properly be called shrimp. In addition there is the langostino (probably

Table 1 - Ch	ilean Shrim	p 1/Landing	gs, 1945-54
Year	Quantity	Year	Quantity
	1,000 Lbs.		1,000 Lbs.
1954	223	1949	69
1953	57	1948	79
1952	48	1947	183
1951	36	1946	114
1950	53	1945	116

1/ Does not include langostino,
Source: Ministerio de Agricultura, Direccion General de Pesca y
Caza, Republica de Chile,

several species of Galatheidae, the most important of which is <u>Cervomunida johni</u>), but this is not truly a shrimp.

Of the shrimp, the one nearest shore (taken in depths up to about 30 fathoms) is called the beach shrimp (camaron de la playa), Rynchocinetes typus. It is a small shrimp that runs about 100 headless to the pound or smaller. It is taken

in traps and sold alive to nearby bars and restaurants.

The pink or nylon shrimp, <u>Heterocarpus reedi</u>, is a newly-described pandalid shrimp, pink in color, occurring in depths between 100 and 200 fathoms. This also



Fig. 1 - Sometimes the Chilean trawler catches are almost entirely of langostinos as shown in this photograph. The crew is sorting the catch.

is a small shrimp though somewhat larger than the beach shrimp. The cooked peeled meats average about 75 to the pound. It is fished for only on occasions as the market demands. They are brought in whole, without ice, and sold cooked-peeled, either fresh or frozen.

There is still another shrimp, the "gamba" (probably a pandalid) which is bright red and occurs in depths beyond 200 fathoms. It is larger than the other two forms, the largest specimens are reported to run 20 to 25 to the pound fresh headless. It has only been taken experimentally, although one fisherman stated that the best

hauls he made averaged about 2,000 pounds of whole shrimp an hour, with a 50-foot trawl. This shrimp appears to be the most promising for future export markets. One boat was being outfitted by a private company to fish for this species.

The above three species (and probably some yet unidentified shrimp) comprise the shrimp fishery, which is small and for local consumption. The 1954 catch was about 223,000 pounds of whole shrimp.



Fig. 2 - Trawler catches often include a large proportion of langostinos.

The cooked meats of the langostino, mentioned above, are white with a reddish exterior and are quite tasty. These meats run about 35-50 to the pound cooked, and are flat rather than cylindrical like shrimp and prawns.

The langostinos occur in the same general habitat as the hake. They are usually taken at around 80 fathoms. The fishery for them began in 1953 when over 2 million pounds were taken. In 1954 over 5.8 million pounds were caught, some of which were canned as "rock lobster tails."

The local demand for langostinos has increased rapidly during the past three years. Prior to 1953 so few were sold that no production records were kept. In Santiago (September and October 1955) they were on almost all menus in the majority of the restaurants.

Langostinos are mostly marketed cooked-peeled or frozen cooked-peeled, though some are canned and some sold raw whole. The popular retail style in Santiago is cooked-peeled in transparent plastic bags of 2.2 pounds which retailed in October 1955 for about 60 U.S. cents (at the free rate of exchange.)

When hake are abundant, fishing for langostinos is sporadic, depending on market demand. The langostino trawl has smaller mesh than the hake trawl.

Shrimp and langostinos are landed whole, raw, and un-iced. The boats leave in the early morning, and return in late afternoon of the same day.

The principal ports are Antofagasto, Valparaiso, and San Antonio.

The prospects of increasing the catch in the present areas of operation are quite good, depending on market conditions. It is more than possible that new areas will be developed as the market grows.

The net that is used for the red shrimp fishery is 49 feet at the mouth. The wing mesh is 2-inch stretched, 18 thread. The bag is double-meshed 2-inch stretched, 42 thread. The doors are $6\frac{1}{2}$ feet by 3 feet; bracketed, and spaced with about 26-foot leads from the net. The lead line is cable and rope, wrapped. Glass floats are on the cork line. Like most Chilean trawlers the boat is rigged with gallows and uses $\frac{1}{2}$ -inch diameter steel towing cables.

Some shrimp are marketed alive, but the majority are sold cooked-peeled fresh and some cooked-peeled frozen. The shrimp are landed the same day as caught. They are brought in whole and not iced. They are trucked to the factory and immediately boiled in sea water; after cooking they are peeled by hand. They are generally sold the next morning.

The cooked-peeled frozen shrimp are handled in the same manner up through the peeling. Later they are layer-packed by hand in stainless steel, elongated, rectangular trays, holding a little more than 7 ounces. They are covered with water and frozen in a plate freezer. In 1954 slightly over 220 pounds were prepared as described from about 2,600 pounds of raw whole shrimp in one plant in Valparaiso.

In the same year 57,000 pounds of raw shrimp produced 7,000 pounds of cooked-peeled shrimp. In all, 60,000 pounds of whole shrimp were processed. The yield in cooked-peeled meats of shrimp is about 13 percent of the total live weight. (Langostinos only yield out about 7 percent of cooked-peeled meats.)

REVIEW OF THE FISHERIES: Fish and Shellfish Catch: Chile's fish landings (round weight) in 1954 totaled 230.1 million pounds, the bulk of which was hake --123.7 million pounds. In the same year shellfish landings amounted to 86.2 million pounds, of which 5.8 million pounds were langostinos and 223,000 pounds were shrimp.

German capital is reported entering the hake fishery in increasing amounts, particularly in the southern part of the fishery. Besides trawlers they are financing fish-meal plants.

<u>Fisheries Workers</u>: In 1954 Chile had 13,700 persons working in the fishing and whaling industries, of which about 9,100 were fishermen and 4,600 worked ashore in plants.

Fishermen in general are paid fixed wages and a little additional for each box (about 55 pounds for hake and 33 pounds for langostinos) above a fixed quota. There are no regular shrimp fishermen, but about 100 may fish occasionally for langostinos. In general, a fisherman's wage is comparable to that of a skilled manual laborer in Chile.

<u>Vessels</u>: Some of the fishing trawlers are used exclusively for hake, other fish for hake and occasionally langostino, and less frequently a few try fishing

for shrimp. In 1954 there were 42 trawlers operating in Chile; all but one were along the central coast between Valparaiso and Taleahuano. There is a closed fishing season from September 1 to December 31 between Quintero and Quintay.

<u>Foreign Trade</u>: The fishing and whaling industries, by special decree for a period of 10 years from August 3, 1953, are the only industries in Chile which may

freely use foreign exchange obtained from export sales. (The free exchange, from about mid-September to mid-October 1955, fluctuated between about 600 and 750 pesos to a United States dollar. The official rate for export and import of most products is about 300 pesos to the dollar.) If they make use of this privilege they may not take advantage of the official foreign exchange rate for importation of machinery, boats, and fishing gear.

Some fishing companies take advantage of the foreign exchange privilege while others do not. Their decision is based mostly on anticipated imports of machinery and equipment.

Export permits are required on fishery products and local quotas must be fulfilled before permits are granted. Also there are local price ceilings. As a consequence certain injustices occur. For example, Chile's greatest fishery export is hake fish meal.



Fig. 3 - Boxes of sardines and anchovies for the cannery at El Rio, a small fishing village on the Chilean coast,

Local consumption requires about 5,000 metric tons of fish meal a year which comes mostly from Valparaiso and San Antonio because of lower freight rates owing to shorter distances between producing and consuming points. The local price ceiling is about one-half that of the world market. As a consequence the plants at Valparaiso and San Antonio are complaining since they must carry the entire load for local markets.

Since 1949, Chile has not imported any fishery products. This was accomplished first by not including these items in the foreign exchange budget and later by direct prohibition. Previously, small amounts of canned and dried shrimp were imported from the United States, but the amounts were never appreciable.

Government Assistance to the Fisheries: The Chilean Government has shown much interest in developing the fishing industry in general. This has been manifested through CORFO (Industrial Development Corporation) and through special legislation.

The CORFO began fishing operations in 1939 and in 1942 started a trawling company for hake. Now that fishery enterprises are well established in Chile, the CORFO is gradually withdrawing. They are selling all enterprises with the exception of the plant in San Antonio. There work will be devoted to a great extent to exploratory trawling for hake in areas not now fished. They are also purchasing a Norwegian filleting machine and fish-meal plant.

The CORFO also assists the fishery industry in obtaining beneficial legislation.

Decree No. 208 of July 21, 1953, grants special privileges to the fishing industry, some of which are:

- 1. Small boat owners, who operate their own boats, are exempt from certain taxes for a period of 10 years from date of publication of the law.
- 2. For this same period fishing industries and fish transformation industries are:
 - a. Exempt from certain excess profits taxes.
 - b. Have free use of foreign exchange, but if they use this privilege they are not entitled to official exchange on importation of machinery, boats, or fishing gear.
 - c. Boats are subject to minimum charges for port costs, use of radiotelephone equipment, and pilotage fees.
 - d. Exempted or have a reduced rate on several other taxes.
- 3. The fishing industry, and other industries which use at least 80 percent raw materials coming from the sea, are exempt from ad valorem import duties and storage, statistical, and customs taxes as well as consular fees.
- 4. Authority is given the President to expropriate lands adjacent to the sea for construction of low cost housing for fishermen and for fishery schools.

In addition to the above special legislation on fishery enterprises, the Chilean Government has special legislation designed to induce foreign capital to invest in Chile. This legislation grants exemption to certain import fees, provides means for withdrawing profits and capital investment from the country, and provides various other concessions for foreign investments.

The government provides special low rates for the shipment within the country by rail of low-priced fishery products.



Denmark

FISHERY PRODUCTS CATCH AT RECORD LEVEL IN 1955: The catch of fishery products by Denmark in 1955 broke records for both quantity and value, according to a report in the January 6, 1956, Dansk Fiskeritidende, a Danish trade periodical. The total catch amounted to about 923.7 million pounds as compared with 778.2 million pounds in 1954. Fishermen received about US\$36.2 million for the 1955 catch as compared with US\$32.0 million in 1954.

Exports of fishery products increased to a value of US\$36.9 million from a total of US\$32.7 million in 1954. The article stated that there were good prospects for further expansion of the exports of fishery products because Danish exports were well accepted on the world market and were competitive in every respect. Expansion of foreign markets would require an increase in the sales and distribution systems.

It is believed that the production from nearby waters has not reached its peak, but in future years, the Danish fisheries would have to depend on the distant fishing grounds off the Faroes and Greenland. This would require larger and more seaworthy fishing craft.



French Morocco

FISHING INDUSTRY, 1954: Landings: The salt-water fish and shellfish landings by French Morocco's fishing fleet in 1954 totaled 93,200 metric tons (valued

Table 1 - French N	Morocco's Salt-Wate	er Fish and Shellf	ish Landings, 1954					
Species	Quantity	Species	Quantity					
	1,000 Metric Tons		1,000 Metric Tons					
Fish:								
Sardines	76.6	Anchovies	0.3					
Bluefish	4.5	Gurnard	0.3					
Young hake		Ray	0.3					
Sea bream		Sole	0.3					
Tuna		Shark & dogfish .	0.2					
Plain tuna	0.6	Mackerel	0.2					
Bonito, skipjack,		Shad	0.2					
plain bonito	0.9	Hake	0.1					
Croaker	0.6	Red mullet	0.1					
Lichia vadigo	0.6	Other (more than						
Cuttlefish	0.4	17 species)	2.1					
Continued in oppos	ite column	Total fish	92.4					
Shellfish:								
Prawn and shrim	p		0.6					
Other 1/	0.2							
Total shellfish.	Total shellfish0.8							
Grand total			93.2					
1/ Includes lobster, crayfish	n, and other shellfishall les	ss than 25 tons.						

at about US\$6.8 million ex-vessel) as compared with 127,996 tons (valued at about US\$7.6 million) in 1953 and 121,973 tons in 1952. The decline in landings between 1954 and 1953 was due primarily to a sharp drop in sardine landings--76,582 tons as compared with 103,413 tons, according to an August 19 dispatch from the United States consulate at Casablanca.

<u>Disposition of Catch</u>: During 1954 approximately 75.6 percent of the total landings were processed (canned, salted, etc.) as compared with 77.7 percent in 1953. The balance, except for small quantities used for bait, was consumed as fresh (see table 2). In 1954 a larger proportion of the sardine catch was used for canning (61.2 percent in 1954 as compared with 38.9 percent in 1953) resulting in much smaller quantities used for reduction into fish meal and oil.

Catch by Ports: Although salt water fish and shellfish are landed at 8 ports, the ports of Agadir and Safi lead the other 6 ports in total landings by a wide margin. The three ports of Agadir, Safi, and Casablanca accounted for 87.9 percent of the total salt-water landings in 1954, 88.1 percent in 1953, and 85.8 percent in 1952.

<u>Fresh Fish Industry</u>: The consumption of fresh fish delivered by the French Moroccan nonindustrial fishing fleet declined considerably in 1954. Fresh fish

Table 2 - Disposition of French Moroco Shellfish Landings, 1953-54	o's Fis	sh and
Item	1954	1953
	1,00	00
	Metric	Tons
Fresh as landed:		
In ports	13.9	15.1
Inland	0.3	4.6
Exported	8.3	8.7
Total fresh	22.5	28.4
Processed (canned, salted, dried, etc.):		
Sardines used for canning	43.0	38.7
Other used for canning, curing,		
reduction, etc	27.3	60.7
Total used for processing	70.3	99.4
Used as bait	0.2	0.2
Grand total 1	/93.0	128.0
1/ Does not include 178 tons of mollusks.		

consumption in inland French Morocco declined so much as to cast serious doubt on the future of fresh fish as a staple item in the national diet. Fish consumption in seaboard localities, and particularly in Casablanca, declined substantially also.

The financial situation of the nonindustrial fishing industry, which supplies the fish and shellfish consumed fresh, during the year was considerably better than it had been in 1953, although the fresh fish catch was smaller than during the previous year and the danger persisted that

the continued utilization of too fine trawl nets will gradually deplete the sedentary fish along the Moroccan coast. Zoning regulations were strengthened in an effort to prevent fishing in given areas during certain seasons and in order to aid in conservation in coastal waters,

During the year the size and distribution of the nonindustrial fishing fleet underwent few changes. Casablanca continued to be the only important fresh fish market.

Tab.	Table 3 - French Morocco's Total Fishery Products Exports, 1954								
Commodity	Quantity	Value	Commodity	Quantity	Value				
	Metric Tons	US\$1,000		Metric Tons	US\$1,000				
Sardines, frozen	2,277	422	Salt-water mollusks	37	9				
Sardines, fresh	2,293	382	Sardines, canned	31,147	16,795				
Tuna, fresh	457	120	Tuna, canned	1,311	934				
Other salt-water fish		413	Mackerel, canned	30	10				
Dried fish, except cod		15	Other canned fish	35	18				
Smoked fish	30	9	Crustaceans & mollusks,						
Sardines, salted		131	canned	118	161				
Other salted fish	110	23	Fish meal		1,088				
Crustaceans	266	100	Fishoil, except cod-liver oil	2,125	334				

The number of trawlers officially attached to the port of Casablanca at the beginning of 1955 was 36, according to reliable figures, and their combined tonnage equaled 2,673 tons. However, beginning in 1954 a growing number of these trawlers moved to the port of Agadir where the fishing was better and the boats less subject to workstoppages by Moroccan crew members for political reasons. By mid-1955 as many as half the number of trawlers attached to Casablanca were fishing from Agadir and marketing their catch in Casablanca, using from two to ten refrigerated trucks daily for transporting the fish. Other ports with trawlers which provide fresh fish for regional markets were: Port Lyautey (6 trawlers, total of 321 tons), Agadir (5 trawlers, 325 tons), Rabat (2 trawlers, 54 tons), and Fedala (1 trawler, 28 tons).

In addition to deliveries by the trawler fleet, the French Moroccan fresh fish market continued to be supplied by ocean-going fishing clippers, two of which (the El Resk and the El Marbrouk) made several trips to Mauritanian waters during the winter months, bringing back from 70 to 100 tons at a time of such species as tuna, sole, croakers, and several varieties of bream. One of these clippers is equipped with freezing facilities and the other with refrigerated holds. Following the winter's fishing season, these clippers were employed in transporting fresh sardines

to such French Atlantic ports as Bordeaux and Nantes. There are reportedly no plans for increasing the clipper fleet within the foreseeable future, despite the value of such boats in the gathering of fresh fish and the delivery of tuna catches for the canning industries.

The total supply of French Moroccan table fish was delivered by units of the local fishing fleet during the year under review, with the exception of a certain quantity of lobsters which was delivered to the Casablanca market by ocean-going lobster boats from Brittany which fish in Moroccan waters for the Moroccan or





Fig. 1 - Typical purse-seine vessel used for sardine fishing in French Morocco.

Fig. 2 - Brailing sardines aboard a Moroccan fishing vessel.

French markets. The local fresh fish market, therefore, relies on the activity of the nonindustrial trawler fleet, which, apart from three larger clippers, is organized along artisan lines and frequently employs crews whose skills and training are inadequate.

Sardine and Tuna Fishing: The 1954 industrial fishing season was seriously below normal with regard both to the quantity of the catch (principally sardines) and the quality of the fish.

According to the Protectorate Government's Scientific Ocean Fishing Institute, the unsatisfactory sardine season was occasioned by unfavorable atmospheric and ocean conditions. The director of the Institute explained that the sardines habitually move toward spawning areas where water is warmer (between $18^{\circ}-20^{\circ}$ C. or $64^{\circ}-68^{\circ}$ F.) in late fall and early winter. These areas are located on the Moroccan coast between Casablanca and Cap Spartel on the north (which explains why Casablanca and Mazagan enjoy good fishing late in the season), and between Agadir and Spanish Sahara in the south. In springtime, however, the sardines move northward or southward toward the cooler waters between Mazagan and Agadir, where temperatures vary between $14.5^{\circ}-16.5^{\circ}$ C. or 58° and 62° F. During the past season adverse winds prevented the collection on the Moroccan coast of the cooler waters necessary for the migrations of sardines, as a result of which the fish remained near the spawning areas, that is, either south of Morocco or northward near Portugal.

The Scientific Ocean Fishing Institute played an important role during the 1954 fishing season, particularly with respect to its program for detecting and signaling

schools of sardines prior to the departure of the fleets for the fishing grounds. This was accomplished by the use of two sardine pilot boats attached one to the port of Safi and the other to Agadir, which departed daily approximately eight hours before the fleets for the purpose of studying the sea with sounding devices and hydrographic instruments. These services, which were available only to the fishing industries



Fig. 3 - Unloading sardines at the fish pier in Agadir.

of the two major sardine ports, were provided by the Institute but subsidized by the interested canners and boat owners. An innovation in the field of scientific fish detection was made during the year by an association of canners at Safi which chartered an airplane to search the fishing waters visually for schools of sardines and communicate results by radio to the fishing fleet. Whereas those concerned with the experiment were enthusiastic over the outcome. the director of the Institute considered that the method was not efficient inasmuch as only schools of sardines close to the water's surface could be detected visually. The director is interested in equipping aircraft with electronic devices which might permit them to discover banks of fish at lower levels, provided such techniques are practicable.

The 1954 tuna catch was also a great disappointment, since the tonnage delivered fell to little more than one-third that of 1953. Tuna was fished by the industrial fleet, as well as by means of two tuna nets (madragues) located respectively about 32 miles north of Port Lyautey near the border of Spanish Morocco, and in the Bay of Agadir. These nets extended outward from the shore to a distance of two to three miles, and were provided with the usual arrangement of lead and dead chambers. The northern net, which was the largest, was destined for the collection of red tuna, while the net at Agadir collected other table fish in addition to tuna.

The disappointing results of the 1954 tuna catch caused the Scientific Ocean Fishing Institute to redouble its efforts to prove to the fishing industry and the general public that an important future lies in the development of the tuna fishing grounds along the Atlantic coast of French Morocco. In fact, it is the aim of the Institute to encourage the development of tuna fishing to a point where it may eventually constitute a major economic activity, and one approaching in importance that of sardine fishing. It is believed that tuna exist in large numbers in the deeper waters off the Atlantic coast, and particularly in the straits between the mainland and the Canary Islands. As in sardine fishing, the industrial fleet now generally fishes for tuna in the shallower coastal waters in depths of less than 230 feet, whereas the same boats with present equipment could catch tuna in deeper waters. The Institute intends to conduct tests and experiments with a view to determining the methods of tuna fishing best adapted to Moroccan waters. An experimental tuna (and sardine) boat was scheduled for construction at Casablanca and, beginning in 1956, was expected to undertake studies on scientific fishing methods in local waters. The boat was to be 82 feet long and equipped with a 260 horsepower engine; it was to be furnished with the most modern fishing devices, including nylon nets and equipment for vertical and horizontal soundings. The Institute hopes, as a result of such experiments,

to be able to counsel the industrial fishing fleet on the subject of deep-sea tuna fishing, so that a greater number of boats can be employed in this activity and eventually the entire sardine fleet can engage in tuna fishing during the months between the end of the year and the following May when the fleet is normally idle.

The industrial fishing fleet consisted of some 350 sardine boats employing on the average a crew of 15 men, according to reliable but unofficial figures published early in 1955. The largest sardine fleet is located at Safi and consists of 133 vessels with a combined tonnage of 3,500 metric tons. The second fishing fleet is attached to the port of Agadir and consists of 127 vessels with a combined tonnage of 2,300 tons. The Casablanca fleet consists of 57 boats with a combined weight of 850 tons, while the Mogador fleet numbers 14 vessels. In addition, from 3 to 7 boats are attached to each of the ports of Fedala, Mazagan, Rabat, and Port Lyautey. Whereas the average French Moroccan sardine boat has a weight of 20 gross tons, boats operating from the southern ports in particular weigh up to 35 tons and are frequently 39-49 feet long and 16 feet wide and draw $6\frac{1}{2}$ feet of water. While the horsepower of motors varies considerably, the average boat has a speed of about 13 knots and is adaptable to deep-sea fishing conditions.

Canning Industry: During 1954 a total of 70,257 metric tons of fish was delivered to the processing industries, compared to 99,390 tons in 1953. An indication of the importance of the production of salted, dried, and smoked fish can be obtained from the following statistics on the exportation of these commodities during the year: salted sardines 715 tons (812 tons in 1953), other salted fish 110 tons (12 tons in 1953), dried fish 71 tons (212 tons in 1953), and smoked fish 30 tons (9 tons in 1953). The greater part of these exports again was directed to France and French Union countries.

Of the remaining tonnage of fish for processing, some 42,982 metric tons of sardines were used for canning during the year, compared to 38,698 tons during the preceding year. Since the quantity of sardines processed by the French Moroccan canning industry was roughly equal to that of 1953, the reduction by 30,000 tons in the total sardines available for processing purposes was particularly disadvantageous to the fishery byproducts industry.

In 1954 the French Moroccan canning industry produced 1,300,000 cases of canned fish, according to the most reliable available figures, compared to 1,400,000 cases produced in 1953. While the tonnage of sardines for canning in 1954 was slightly higher than in 1953, the inferior quality of the fish resulted in greater waste and consequently a smaller output. The output of canned tuna and other varieties of fish likewise declined as a result of the unfavorable fishing season.

Exports: According to official statistics, exports of French Moroccan canned sardines during 1954 equaled 1,500,000 cases (31,147 metric tons), compared to slightly over 2,000,000 cases (42,527 tons) exported during the preceding year. This drop in exports was accompanied by reduced shipments to a great majority of markets by comparison with the preceding year's record. Exports to the United States declined from 163,090 cases (3,368 tons) in 1953 to 57,456 cases (1,037 tons) during the year under review. By way of exceptions to this rule, exports increased during the year to such areas as French West Africa, British African Territories, Italy, Uruguay, Syria, Belgium-Luxembourg, Togoland, and particularly to Great Britain, which purchased some 32,800 cases of French Moroccan sardines compared to 886 cases in 1953. It should be noted that the less favorable export situation was due entirely to reduced production as a result of insufficient raw materials, and not to prices for the French Moroccan product which remained at the level of the preceding year.

Paralleling this reduction in French Moroccan canned sardine exports was the considerable increase in competitive canned sardine exports by Portugal. The

Portuguese product was sold in larger quantities in a majority of markets during the year, and particularly in those of a number of European countries. (Total Portuguese sardine exports in 1954 equaled 42,000 metric tons, compared to 32,000 tons during 1953, according to published statistics. The United States reportedly purchased 136,000 cases or 2,457 tons of Portuguese sardines.)

Byproducts: The byproduct industry of French Morocco suffered from the greatly reduced sardine tonnage used for reduction. The promising development and expansion of this industry was abruptly checked. During the year exports of fish meal declined to 8,832 metric tons, compared to 16,434 tons shipped during 1953. The portion absorbed by the United States remained equal to that of the preceding year, but an anticipated rise in shipments to this market was prevented by lack of available output. Similarly, fish-oil exports in 1954 declined to 2,125 tons from 3,581 tons in 1953.

Exports: The United States again purchased three fishery products in French Morocco in 1954. United States imports of canned sardines in 1954 fell to 1,037 metric tons (57,456 cases), compared to 3,368 tons (163,090 cases) in 1953, the United States moving from third to eighth place among French Morocco's customers. While not again importing canned tuna in 1954, the United States nevertheless purchased 700 pounds of canned mackerel. Finally, United States imports of fish meal remained at the level of the preceding year, with 5,836 metric tons purchased in 1954 compared to 5,851 tons in 1953, the United States remaining the first customer of French Morocco for that commodity.

Outlook: To solve the ship owners financial difficulties because of smaller catches, the Government took the following measure in 1955: most canning factories were "concentrated" into several groups, in which only the best equipped and most important plants process the entire production, in order to reduce the general expenses and to make possible the payment of higher prices for fresh fish supplies. There are now in Morocco 25 groups consisting of 130 factories; 55 plants remained independent, and 15 semi-independent.

However, the difficulties met by ship owners, due to defective organization of the wholesale fish market and to the poor condition of the old fishing fleet, could not be solved, despite larger Government loans and higher prices paid by canning factories for industrial fish. In fact, these measures, to be efficient, implied normal fish supplies. During the first semester of 1955, according to the local press, the total industrial catch of sardines was only 20,000 metric tons, compared to 77,000 tons during the 1954 calendar year. This decrease in production was particularly noticeable at Safi, where the catch from January 1 to June 30, 1955, reached only one third of 1954's total production. The reason for this decline, the local press observed, was primarily political, as strikes started at Safi at the very time when fish were plentiful along the coast.

Note: See Commercial Fisheries Review, February 1955, pp. 58 and 97; October 1955, p. 81.

Values converted to US\$ on the basis of 350 francs equal US\$1.



German Federal Republic

IMPORT DUTIES ON CERTAIN FISHERY PRODUCTS LOWERED: In an effort to reduce prices of various items, duties have been temporarily lowered on 120 categories, including a few fishery products, of German tariffs. The following list gives the tariff description of the fishery products with their present temporary rates in percent ad valorem; and normal rates shown in parentheses.

Ex 0301.* Fresh or frozen salt-water fish, wholly or divided into portions, except fillets: Haddock, ling, rosefish, halibut, codfish, and sea salmon, free (10).

Ex 1504. Cod liver oil, raw, free (5).

Ex 1604.* Sprats (Clupea sprattus) in airtight containers, 14 (15).

The "ex" preceding the number means that the discription does not cover all items appearing under that number in the tariff schedule. The "asterisk" following the tariff number indicates that an individual license is required for import of that item.

(C)

Gold Coast (British)

IMPORT LICENSES FOR CANNED FISH REQUIRED: Exporters of canned fish from the United States and Canada to the British Gold Coast are required to have licenses in 1956, according to a January 31 dispatch from the United States Consul in Accra. "Notice to Importers No. 4" was published in the Gold Coast Gazette of January 21, 1956. Similar licenses were required in 1955 and 1954.



Greece

DEEP-WATER TRAWLING PARTIALLY SUCCESSFUL: The Greek trawl fishery in depths up to 250 fathoms has been profitable only at certain places and at certain seasons of the year, according to a well known trawler owner. In prewar days deep-water fishing was undertaken at only a few places, but after the war successful attempts were made in depths of 150-180 fathoms off Mytilene. Other trials off Crete were made in 150-250 fathoms, according to the December 1955 Aleia, a Greek monthly fishery magazine.

Since the early successful trials in 1950, Greek trawlers have fished regularly in depths ranging between 100-250 fathoms and trials have been made in depths up to 360 fathoms.

* * * * *

SPONGE FISHERY, 1955: During the April to November 1955 sponge fishing season in Greek, African, and International waters, Greek sponge fishermen harvested 126 metric tons. The fleet of sponge fishing boats consisted of 147 craft and 45 auxiliary vessels with 705 divers and 812 crewmen, according to Aleia (December 1955).

Israel

IMPORT DUTIES ON SOME FISHERY ITEMS CHANGED: Tariff items affected by changes in customs duties in affect since August 1955 include herring in brine, dried fish, and canned fish, the United States Embassy at Tel Aviv reports. The new rates are: specific in Israeli pounds per kilogram, and/or percent ad valorem; former rates are shown in parentheses.

129: Herring in brine, financed by allocation of foreign currency, 0.004(0.004); otherwise financed, 0.003(0.004).

130: Dried fish, cod type, 0.010 (0.010), but exempt if imported for fish meal.

132: Canned fish, 2.000 (1.000)

132a: Fish other than herring, in brine, 1.000 (0.750) Note: 1 Israeli pound = US\$0,56.



Japan

ARGENTINE COASTAL FISHERIES SURVEY POSTPONED: The Japanese Fishery Agency's research vessel Toko Maru (1,098 tons) was to have been sent to Argentina in November for fishing explorations, but because of changes in the Argentine Government its sailing was postponed several times. Now because of budgetary considerations, the dispatch of the vessel has been given up for this fiscal year. It is believed that if the situation in Argentina becomes clarified the cruise may be made in the next fiscal year, probably in October, according to the January 16 Nippon Suisan Shimbun.

Note: Also see Commercial Fisheries Review, October 1955, p. 93

* * * * *

NEW GUIDANCE AND RESEARCH SHIP LAUNCHED: The new guidance and research ship Sagami Maru (680 tons), of Kanagawa Prefecture, was launched in February at Shimizu. This vessel, built at a total cost of US\$433,000 was under construction since the summer of 1955 and was planned since 1954, or immediately after the formulation of a fisheries agreement between Ceylon and the fishing industry of the prefecture. Its construction is another step in the program of relieving the depression in the coastal fisheries by shifting effort to the high seas.

The new ship represents an increase of the prefectures's research potential, as compared with the old 160-ton <u>Sagami Maru</u>, and it has the most modern equipment, including a dispensary and a repair shop, so that it can perform the functions of a mothership for Kanagawa Prefecture fishing boats operating in such distant grounds as the Indian Ocean reports the January 26 Nippon Suisan Shimbun.

* * * * *

SHRIMP CATCH AND EXPORTS, 1952-54: In the years 1952-54 the Japanese catch of shrimp averaged close to 100 million pounds annually. Most of the catch is consumed in Japan, but some frozen, canned, and dried shrimp are exported. The

	Table 1 - Japanese Shrimp Catch and Exports, 1952-54									
Exports										
Year	Catch		Frozen			Dried			Canned	
	l	U.S.	Other	Total	U.S.	Other	Total	U.S.	Other	Total
-			(1,000	Lbs.) .				(Cases)		
1954	112,040	270	21	291	101	1,285	1,386	22	72	94
1953	91,096	244	29	273	132	972	1,104	624	1 56	780
1952	96,734	-		-	-	-	-	377	407	784

United States' share of the frozen shrimp exports was about 89.4 percent of the 273,000 pounds exported in 1953 and 92.8 percent of the 291,000 pounds exported in 1954.

The shrimp catch is made up of three predominant species: "kuruma-ebi" (Penaeus japonicus), "kuma-ebi" (Penaeus semisulcatus) both averaging about 5 shrimp to the pound; and "shiba ebi" (Penaeus joyni) averaging about 40 shrimp to the pound. (Presumably heads-on in all cases.)

The principal shrimp fishing areas in Japan are Uchiura Bay, Hokkaido; the waters off northeastern Hokkaido; the Inland Sea; Osaka Bay; Ise Bay; and Ariake Bay, Kyushu. The fishing season is from June through September.

About 90 percent of the catch is made by small 15-20 ton trawlers using trawl nets. The remainder of the catch is taken by miscellaneous boats using a number of types of gear. Most of the vessels catching shrimp, especially the trawlers, do not catch shrimp exclusively, but take all types of fish, among which shrimp average about half the catch during the shrimp season.

There are no known freezing plants or canneries which operate exclusively for shrimp; during the shrimp season the plants which handle other types of marine products and canned goods simply take on shrimp as an additional line.

At the present time there is little prospect of any unusual expansion of the shrimp fishery.



Republic of Korea

REVIEW OF THE FISHERIES, 1954: The total landings of South Korea's fisheries in 1954 amounted to 248,287 metric tons, according to statistics supplied by

tries in 1991 amounted to 240,200 metric tons, deep ang to statistics supplied sy								
	ic of Korea's	Fisheries Landings, 1954						
Species	Quantity	Species	Quantity					
	Metric Tons		Metric Tons					
Fish:		Shellfish, etc:						
Ray	4,721	Oyster	1,346					
Flat fish	4,795	Clam	412					
Mackerel	26,568	Heart clam	980					
Halibut		Abalones	440					
Perch	747	Sea mussel	652					
Cod	1,568	Crab	1,005					
Sea bream (porgy)	1,398	Octopus	1,114					
Alaska pollock	13,787	Cuttlefish	8,621					
Yellowtail	2,868	Shrimp	13,051					
Big-eyed tuna	128	Prawns	1.878					
Tuna	85	Other shellfish	12,066					
Bonito	17	Total shellfish	41,565					
Anchovy	15,869	Marine Animals:						
Croaker	1,613	Whales	1,748					
Hairtail	28,180	Seaweeds:						
Sardines	15	Dulse	4,136					
Herring	19	Japanese jelly plant	5,482					
Mackerel pike	8,253	Caminariodes	4,432					
Gurnard	21,545	Other seaweeds	3,202					
Other fish	52,647	Total seaweeds	17,252					
Total fish	187,722	Grand total	248,287					

the Office of Marine Affairs of the Korean Ministry of Commerce and Industry. In 1953 landings amounted to 279,053 metric tons.

Landings in 1955 consisted of 187,722 metric tons of finfish, 41,565 tons of shellfish, etc., 1,748 tons of whales, and 17,252 tons of seaweeds.

The production of canned fish and other processed fishery products was not very significant.

South Korea's fisheries exports consisted of dried fish and shellfish, fresh fish and shellfish, salted fish and shellfish, agar-agar, laver, fish-liver oils, canned fish, and other miscellaneous fishery products.

South Korea's fishing fleet in 1954 consisted of 42,186 vessels of which 2,687 were fish-carrier boats and the balance of 39,499 was actually fishing boats. Only a small percentage of the vessels were powered, states a November 23 report from the United States Embassy at Seoul. In 1953 the fishing fleet totaled 42,584 vessels. Note: Also see Commercial Fisheries Review, January 1955, p. 57



Liberia

OCEAN FISHERIES BEING DEVELOPED: Through the assistance of a marine biologist, considerable effort has been expended by a number of Liberian businessmen in creating an ocean-going fishing fleet to tap the rich grounds lying off Sierra Leone and French West Africa. Meanwhile small trawlers and native dugouts and canoes continue to fish the sparse grounds off the Liberian coast.

A Liberian fishery company took the initiative in starting an ocean-going fleet. On September 9, 1955, its one 106-foot refrigerated trawler landed a record 27 metric tons of fish in Monrovia on its maiden voyage. This caused a sudden and temporary drop in the retail price of fresh fish from US\$0.30 to US\$0.10 a pound. A labor dispute has caused the temporary halting of this company's operations.

A fishing company, controlled by mixed Swiss, German, Italian, and Liberian capital is operating one 104-foot refrigerated trawler, and fishing the grounds off of Monrovia on a daily basis. It lands about 4 metric tons of fish each day. As soon as its ice plant, now under construction and nearing completion, is completed it will fish the waters off of Sierra Leone and French Guinea. A second refrigerated vessel was scheduled to arrive from Italy towards the end of 1955. Smoking houses to prepare about 8 tons of fish a day for sale in the hinterland market will be constructed as soon as labor can be diverted from work on the Capitol building.

Another fishing enterprise under the direction of a United States citizen is continuing to fish the Monrovia waters. Launched in April 1954, it operates two 65-foot nonrefrigerated Sicilian trawlers and lands between 1 and 2 tons of fish a day. This company states that it plans to purchase a refrigerated vessel sometime in 1956 in order to fish the Sierra Leone waters, a United States Embassy dispatch (November 23, 1955) from Monrovia points out.

A German national operates a small nonrefrigerated vessel in the Monrovia waters and his daily catches range from 600 pounds to a ton.

Finally, there are countless Fanti, Bassa, and Kru fishermen whose total daily catch is less than a ton of fish. They fish in seven-men canoes or two-men dug-outs according to their custom, and use surface nets or hand lines.

The total landed catch in Monrovia at present ranges from about 36 to 48 metric tons a week, which sells for an average price of US\$0.15 a pound. When the refrigerated vessels begin fishing the larger and richer grounds off of Sierra Leone, this catch will increase to an estimated 120 tons a week with a retail selling price of approximately US\$0.10 a pound.

Mexico

FISH MEAL PLANT PLANS COMPLETED: The holder of various United States patents on the VioBin azeotropic (solvent extraction) process for making fish meal has stated that plans for erecting a plant at Salina Cruz, Oaxaca, Mexico, have been completed. The plant, with a capacity of 75 tons of raw fish, will produce fish meal for animal feeds. The source of the raw material will be the unsalable fish caught by the shrimp trawlers supplemented by fish and sharks from other fisheries.

Reports indicate that the new firm may have some difficulty obtaining sufficient raw material for capacity operations. The new plant is expected to start operations about April 1956 and will cost an estimated US\$100,000, financed by both United States and Mexican capital. If successful, this new plant should be the beginning of another fishing industry in Mexico.

Norway

WINTER HERRING FLEET STARTS 1956 SEASON: Some 25,000 Norwegian fishermen, manning about 1,700 vessels, including 600 superefficient purse-seiners, sailed from Aalesund for the start of the 1956 winter herring fisheries. The ocean research vessel G. O. Sars, staffed by Norwegian scientists, sailed ahead of the

fleet to search for the whereabouts of the herring shoals. Judging from preliminary findings, the fisheries may produce a record catch, granted fair weather, states the January 12 News of Norway.

As soon as the <u>G. O. Sars</u> found the first sizable herring shoal, the exact location was radiotelephoned directly to the fishing fleet, instead of being relayed by Aalesund Radio, as in former seasons. To pinpoint the herring, the Norwegian ocean researchers use several types of electronic instruments, including the re-



A Norwegian drift-netter loaded with herring homeward bound,

cently-developed combination sonar-echo sounder. According to latest reports from the <u>G. O. Sars</u>, large shoals of herring have been contacted in deep water about 85 nautical miles from the Norwegian coast.

In addition to the 600 purse-seiners, hundreds of drift-netters and other vessels are participating plus a fleet of some 500 transport vessels, standing by to carry the catch to herring meal and oil reduction plants. The plants along the coast between $Tr\phi$ ndelag and Vest-Agder had last year a processing capacity of some 34,000 metric tons of raw fish a day, and a storage capacity of nearly 570,000 tons. Both production and storage capacities are larger for the 1956 season, and possibilities for processing the landed herring this year have been improved.

The best year ever for Norway's western herring fisheries was 1954, when landings totaled almost 1,090,000 metric tons, with a first-hand value of US\$28.1 million. The catch for 1955 was somewhat smaller--1,030,000 tons, valued at US\$27.3 million.

* * * * *

RUSSIAN FISHING VESSELS SEIZED INSIDE FOUR-MILE LIMIT: In a series of actions on January 30, 1956, Norwegian navy patrol boat crews boarded and seized 13 Russian fishing vessels which, in violation of international law, were allegedly operating within Norway's 4-mile coastal fishing boundary. The seized Russian craft included a 7,000-ton depot ship and 12 trawlers. Two of the trawlers had to be halted with warning shots. The seizures were made off the western port of Aalesund, where the annual fat herring fisheries are now in full swing. The Russian fishing fleet on the banks was estimated at 50-60 craft, states the February 2, 1956, News of Norway.

In a decision handed down December 18, 1951, the International Court at The Hague upheld the principles of a decree of July 12, 1935, under which Norway had delimited its territorial waters for fishing purposes. Under this decree, still inforce, the limit for foreign fishing vessels follows a series of straight lines drawn at a distance of 4 miles from and parallel to so-called base lines between extreme points along the coast.

In ruling that the decree was in agreement with international law, the World Court observed that Norway for centuries has been delimiting its fishing waters in accordance with special local conditions. Noting that the Norwegian boundary delimitation remained "virtually unchallenged" until the present century, the Court decided that Norway had thus established title to the fishing banks along its coast on historical grounds.



Republic of the Philippines

IMPORT DUTIES ON FISHERY ITEMS RAISED: A general increase in rates of duty which increases those on fishery products 30 percent became effective on January 1, 1956. This action does not alter the tariff preference accorded United States articles under the revised U. S.-Philippine trade agreement. Thus, United States articles imported into the Philippines in the 3-year period 1956-58 will be subject to only 25 percent of the increased duties.

The regular rate of duty on canned sardines, in oil or tomato sauce, has been 15 percent ad valorem. This has now been increased by 30 percent so that the full duty is 19.5 percent ad valorem. (This rate will apply to imports from other countries.) Imports of canned sardines from the United States will be subject to a duty amounting to 25 percent of the 19.5 percent or 4.875 percent ad valorem. This same rate applies to canned salmon and mackerel. Other "commonly prepared fish" have been dutiable at 20 percent and will be similarly increased to 26 percent as a result of the order.

The new basic rate of duty on fishing nets entering the Philippines will be 60 percent ad valorem.

The 17-percent special import tax was not affected by the order. This applies to all canned fishery products except canned sardines.



Portugal

OPORTO THE LEADING SARDINE CANNING CENTER: The Oporto area has gradually become the leading center for sardine canning in Portugal, a February 2 United States Embassy dispatch from Lisbon points out. In the absence of regional statistics, general figures have to be interpreted as a direct reflex of conditions in

its main centre. Thus, total Portuguese canned fish exports, which up to the end of November were up nearly 30 percent in tonnage and almost 25 percent in value compared with the same period of 1954, confirm the view generally held of a fairly successful year for the Portuguese canning industry.

Fishing was more productive and demand from abroad kept abreast of production, so stocks at the end of 1955 were only moderate. In the early part of the season price competition was very keen but towards the end of the year



Portuguese sardine assembly line showing oil machines automatically adding olive oil to fill the cans.

prices had become firmer and trading results appear to have been generally satisfactory.

* * * *

CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1955: Portuguese canned fish exports totaled 5,265 metric tons (277,000 cases), valued at US\$2.6 million,

Species	Sept.	1955	JanSe	pt 1955
	Metric	1,000	Metric	1,000
	Tons	US\$	Tons	US\$
Sardines in olive oil	4,708	1,968	33,962	16,591
Sardinelike fish in olive oil	336	206	3,484	2,315
Sardines & sardinelike fish in brine	205	48	1,495	295
Tuna & tunalike in olive oil	340	244	1,770	1,304
Tuna & tunalike in brine	49	20	545	276
Mackerel in olive oil	189	100	1,040	633
Other fish	41	21	472	260
Total	5,268	2,607	42,768	21,674

during September 1955; and 42,769 tons, valued at US\$21.7 million, during January-September 1955.

Portugal's exports of canned fish in September 1955 maintained the high level of previous months, according to Conservas de Peixe,

December 1955. During January-September 1955 Germany continued as the leading receiver with US\$4.0 million of canned fish (about all sardines in oil), followed by Italy with US\$3.6 million (principally sardines and tuna), Great Britain with US\$2.8 million, and the United States with US\$2.4 million, principally 1,943 tons of sardines in oil or sauce, 11 tons of tuna and tunalike fish in oil, and 1,215 tons of anchovies. Exports of canned fish to these 4 countries amounted to 59.2 percent of the total exports.

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CANNED FISH TRENDS, JANUARY-JULY 1955: The pack of canned sardines in oil or sauce for January-July 1955 amounted to 9,076 metric tons (net weight). The July 1955 pack was 3,296 tons as compared with 2,701 tons in July 1954.

	Portug	guese Canned Fis	h Pack, JanJuly 1955		
Product	Net Weight	Canner's Value	Product	Net Weight	Canner's Value
	Metric	1,000		Metric	1,000
	Tons	US\$ 77		Tons	US\$
Sardines in brine	529	77	Tuna in brine	63	30
Sardines in olive oil or			Tuna in olive oil	749	611
sauce	9,076	4,922	Tunalike fish in olive		
Sardinelike fish in brine	969	292	oil	75	46
Sardinelike fish in oil	2,185	1,210	Other species (including		
Anchovies, rolled & filleted	818	867	shellfish)	512	265
(Continued in opposite column)			Total	14,976	8,320

South Africa

SOUTH-WEST AFRICA AND UNION OF SOUTH AFRICA CATCH AND PACK OF PILCHARD AND JACK MACKEREL, 1954 AND PART OF 1955: The 1955 fishing season for pilchards in South-West Africa ended late in October when its quota of 250,000 metric tons was reached, according to a November 28 dispatch from the United States Consul at Cape Town. It was also reported that the Union of South Africa would probably

Table 1 -								
of Pilchards and Jack Mackerel, 1954 and JanSept. 1955								
			Jack Ma			otal		
	U. of So.	SWest	U. of So.	SWest	U. of So.	SWest		
	Africa	Africa			Africa	Africa		
			(Short	Cons)				
12 Mos.		1	1					
1954	93,791	275,000	133,471	-	227,268	275,000		
JanSept.								
1955	130,803	235,000	85,127	-	215,930	235,000		

reach the seasonal quota of 250,000 short tons late in November. Catch data for pilchard and jack mackerel for 1954 and 1955 through September 30 are presented in table 1.

The pack of canned pilchards and canned jack mackerel to October 23, 1955, is given in table 2. As of this date the production of canned pilchards exceeded that of the entire season of 1954. Unless the

pack of jack mackerel is extremely heavy during the months of November and December, the data indicate a much lower production in 1955 as compared with 1954. It is probable that a larger share of the 1955 jack mackerel catch is being diverted to the reduction plants than was the case in 1954.

Table 2 - South-West Africa and Union of South Africa Canned Pilchard and Jack Mackerel Pack, 1954 and JanOct. 23, 195									
- da	No.Cans PerCase	Pilchards				Jack Mackerel			
		1954		1955 to Oct. 23		1954		1955 to Oct. 23	
		Union of So.	S,-West	Union of So.	SWest	Union of So.	SWest	Union of So.	SWest
		Africa	Africa	Africa	Africa	Africa	Africa	Africa	Africa
		(1,000 Actual Cases)							
1-lb. Oval	48	51.2	84.5	65.9	67.9		- 1	2.7	-
1-lb, Talls	48	225,8	360.9	197.1	545.5	905.3	-	278.4	-
1/2-1b. Bft	48	79.9	333.9	81.1	226.4	93.1	-	170.5	-
1/2-lb, Flat	48	32.6	54,3	55.4	66.4	5,3	-	4.2	-
5-oz. Jitneys	100	-	116.6	14.4	146.3	-	-	-	-
Total	-	389.5	950.2	413,9	1,052.5	1,003.7	-	455.8	-

In addition to the canned pack in table 2, the Union of South Africa canneries in 1954 packed 114,000 actual cases and from January 1-October 23 a total of 109,082 cases of true mackerel.

Through a supplementary allocation by the Union of South Africa Government, the annual catch of pilchard and jack mackerel in South-West Africa (Walvis Bay) in 1954 totaled 275,000 short tons--25,000 tons above the fishing quota imposed by the Government on catches in both South-West Africa and the Union. The quota was first imposed in 1953.



Union of South Africa

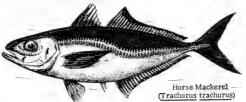
FISH FLOUR FROM MAASBANKER DEVELOPED: After many years of research, the South African Fishing Industry Research Institute has developed a commercially-adaptable process for the production of a neutral fish flour from the cheap and abundant maasbanker (<u>Trachurus trachurus</u>). This fish flour can be introduced to such foods as bread without altering the taste, smell, or color. The addition of the fish flour could be the means of increasing the protein diet of undernourished people, according to the <u>South African Shipping News</u> and <u>Fishing Industry Review</u>, September 1955.

The final discovery in a search that has engaged fishing industrialists as well as scientists was made recently after two years of intensive experiment in the Cape

Town laboratories. The process is efficient and economical, and the finished product is completely without smell or fishy taste. The fish flour is a new and potentially-valuable product of the South African west coast fishery.

Neutral fish flour is no revolutionary discovery and had actually been produced years ago in some of the more highly-developed fishing nations. A good white fish

flour was also produced some years ago in South Africa. What the Institute has achieved, in collaboration with the fishing industry, is a process ideal for large-scale production using raw material sufficiently cheap to make the project a better business proposition.



The processing methods adopted go through four stages. These are: (1) A special mixed solvent to remove the oil. This is the basic operation and renders the meal almost completely neutral. After the solvent has removed the oil, a cheap and easy way of reclaiming the solvent and making it available for continued use was found. (2) Faint traces of smell and flavor are removed together with certain off-flavors. (3) In the third stage, residual trace flavors are effectively masked. (4) Whatever minute trace of smell or flavor remains is caged in each flour particle.

The final problem encountered by the Institute was that of blending the fish flour into an acceptable bread. It was found that up to eight percent fish flour could be added to the bread but the two percent level is recommended for use in the enriched bread. The fish flour produced from the maasbanker was found to remain neutral under storage conditions.

A pilot commercial plant will start producing the flour in the Dido Valley factory of Marine Oil Refiners of Africa Ltd. This will be a standard solvent extraction plant plus additional equipment for the final stages.

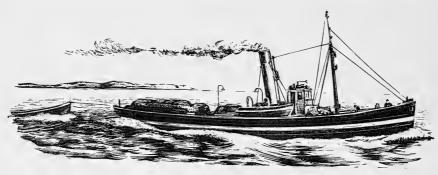
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Spain

REVIEW OF THE 1955 FISHING SEASON AT VIGO: Landings: The fishing industry, the most important single industry in the Vigo area, was better off than in 1954. Landings at the port of Vigo, as reported by the local Fish Exchange, totaled 134 million pounds or about 10 percent over 1954 (value increased 18 percent). Catches of the types (needlefish, small hake, and hake) used for local consumption were relatively good, but cod catches were fair. Unfortunately for the canning industry, sardine, albacore, and anchovy were not abundant. The sardine catch, which in former years was the basis of the fishing and canning industry in the Vigo area, improved during the 1955 fall months, but was still seriously below totals of 8 or 10 years ago. The scarcity of sardines continued to be a source of concern.

Limited progress was made in the modernization of the fishing fleet during the year. The loan of about US\$1.1 million toward this end made through the National Government to the fleets at Vigo and Marin was helpful but considerably below needs. While supplies of Diesel oil and coal were satisfactory, the price of nets and other equipment remained extremely high and the supply situation unsatisfactory. In spite of the various difficulties faced by the industry in 1955, the over-all picture was comparatively good, principally because of high prices paid for the catches.

Canning Industry: The fish canning industry did not enjoy a good year because of the scarcity of albacore, sardines, and anchovies. At least one local firm of importance is known to have had to cancel contracts for export to the United States



Typical Spanish sardine mothership, "Galeo" (about 40 gross metric tons and 66 feet in length), uses large seine net which occupies most of the deck space,

because of the scarcity of albacore. In the absence of these varieties the industry canned aguja, or needlefish, used as a substitute in the local market for sardines. Scarcity of tinplate, oil, and other essentials continued. However, in view of the scarcity of raw fish for canning, these shortages had no serious effects. The year as a whole then for the canning industry was poor.



Surinam

NEW PLANT TO PACK SHRIMP: A new shrimp freezing and packing plant is expected to start packing shrimp about April 1956, according to a report dated January 25, 1956, from the United States Consul at Paramaribo. The new company, Surinam American Industries, Ltd., will be managed by two United States citizens experienced in the shrimp fisheries and refrigeration. The plant is expected to employ 200 persons either full or part time exclusive of the shrimp fishermen.

The capacity of the plant is reported to be about 10,000 pounds of cooked and peeled shrimp a day under normal operating conditions with a storage capacity of 100,000 pounds. At the present time the shortage of reefer space on ships to the United States is a factor that might limit the plant's output. If sufficient reefer space could be obtained, the maximum capacity of the plant, on a basis of a 20-hour day, would be about 7 million pounds a year. The plant has new equipment, including a blast-type freezer.

The firm has been granted an exclusive franchise for 15 years and also a tax holiday by the Surinam Government, but final action on the tax holiday has not been issued as yet.



Taiwan (Formosa)

FISH CATCH IN 1955 BROKE ALL PREVIOUS RECORDS: The 1955 fish production in Taiwan reached 180,618 metric tons. This broke all previous records and exceeded the target set in the Four-Year Production Plan by 20,618 tons. (The target for 1955 was 160,000 tons.)

MECHANIZATION OF SMALL FISHING CRAFT: With the installation of Diesel engines on 69 sampans under the assistance of a JCRR (Joint Commission on Rural

Reconstruction) loan in 1954 as a start, the mechanization program gained momentum in 1955. As of the end of September 1955, a total of 463 sampans had been equipped with Diesel engines of 4 to 6 hp. This number includes 151 sampans mechanized with JCRR assistance, but does not include 20 bamboo rafts which

Taiwan Fish Catch, 1954-55								
	1955	1954						
	(Metric Tons)							
Deep-sea fishing	36,413	27,053						
Inshore fishing	51,334	40,462						
Coastal fishing	47,175	43,343						
Fish culture	45,696	41,689						
Total	180,618	152,547						

were equipped with 2-hp. Diesel engines under a JCRR demonstration project.

MILKFISH INDUSTRY SUFFERED FROM COLD SPELL: The cold spell of January 8-12, 1956, dealt the milkfish industry a hard blow. Air temperature dropped to 8°C. in southern Taiwan, where most of the milkfish ponds are located. From some 32 million milkfish fingerlings impounded in wintering ponds, some 22 million were killed by low temperature. This means the milkfish farmers willfind themselves in need of two-thirds of the fingerlings required for stocking their ponds at the initial period of the rearing season.

--T. P. Chen, Fisheries Specialist, JCRR, Taipei, Taiwan.



MIGRATIONS OF FLORIDA SPINY LOBSTERS

The Florida crawfish, or spiny lobster (<u>Panulirus argus</u>), wanders over short distances—about five miles or less. Occasionally, however, individuals or small groups make considerably longer migrations, up to 125 miles. As a result of these movements, a gradual mixing of the lobster population occurs. This is of considerable practical importance since it reveals that the population must be considered as a biological unit. Conditions which affect one part of the population will ultimately influence other parts. For example, overintense fishing in the southern grounds will, over a period of time, deplete the northern grounds. Conversely, an area cepleted will gradually be repopulated by the slow influx of animals from other areas. However, the tendency for the spiny lobsters to remain in a relatively restricted area will make these influences slow to appear.

--The Marine Laboratory, University of Miami, Coral Gables, Fla.



Treasury Department

BUREAU OF CUSTOMS

GROUNDFISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1956:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets for calendar year 1956 is 35,196,575 pounds, the Bureau of Customs announced recently. Divided into quarterly quotas this means that 8,799,144 pounds of groundfish fillets during each quarter may be imported at the $1\frac{1}{3}$ centsper-pound rate of duty, and any imports over the quarterly quota will be dutiable at the rate of $2\frac{1}{2}$ cents per pound.

The reduced-rate import quota for 1956 is 0.7 percent lower than the 1955 quota of 35, 432, 624 pounds, but higher than the 1954 quota of 33,950,386 pounds, the 1953 quota of 33,866,287 pounds, the 1952 quota of 31,472,108 pounds, and the 29,289,808-pound quota of 1951.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks) for the three years preceding 1956 (1953-1955) was 234, 643, 830 pounds, calculated in accordance with the proviso to item 717 (b) of Part I, Schedule XX, of the General Agreement on Tariffs and Trade (T. D. 51802). The proviso states that the import quota for any current calendar year shall be 15,000,000 pounds or 15 percent of the average aggregate apparent consumption in the three years preceding the current year, whichever is greater. The tariff item concerned in summarized form is: "Fish, fresh, or frozen (whether or not packed in ice). filleted, skinned, boned, sliced, or divided into portions, not specially provided for: Cod, haddock, pollock, cusk,

and rosefish (ocean perch)." Fillet blocks and slabs for making fish sticks are also included under this category.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks for the three years 1952-54 was 236,217,495 pounds, slightly more than the consumption for 1953-55.



White House

UNITED STATES MEMBERS NAMED FOR GREAT LAKES FISHERY COMMISSION:

The appointment of the United States members of the Great Lakes Fishery Commission was announced by the President on February 18, 1955. The Commission is composed of six Commissioners, three from Canada and three from the United States.

The United States members appointed by the President are: John L. Farley, Director of the Fish and Wildlife Service, Department of the Interior; Lester P. Voigt, Wisconsin State Conservation Director; and Claude Ver Duin, Mayor of Grand Haven, Mich., and an operator of a commercial fishing business on the Great Lakes.

Note: See Commercial Fisheries Review, October 1955, p. 109.



Eighty-Fourth Congress (Second Session)

Listed below are public bills and resolutions that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber actions on the bills shown are published; and if passed, they are shown when signed by the President.

COMMERCIAL FISHERIES NATIONAL POLICY: S, 3275 (Magnuson and Kutchel) introduced in the Senate February 22; a bill to establish a sound and comprehensive national policy with respect to the development, conservation for preservation, management and use of fisheries resources, to create and prescribe the functions of the United States Fisheries Commission, and for other purposes; to the Committee on Interstate and Foreign Commerce.

"...Sec. 2. The Congress hereby declares that fish and shellfish resources make a material contribution to the health and well-being of our citizens and constitute an important part of the food-producing segment of the national economy, and that a sound and comprehensive national policy with respect to the development, conservation for preservation, management, and maximum use of such resources, the prevention of excessive exploitation thereof, and the promotion and maintenance of prosperous and productive conditions in both the commercial and the sport and recreational fisheries industries is essential in the public interest. The Congress further declares that the provisions of this Act are necessary in order to accomplish such objectives, and that this Act shall be administered with due regard to the inherent right of every citizen and resident of the United States to engage in fishing for his own pleasure and enjoyment.

"Sec. 3, (a) There is hereby created an independent agency of the Government to be known as the United States Fisheries Commission (hereinafter referred to as the 'Commission') which shall be composed of five members to be appointed by the President, by and with the advice of the Senate. One of such members shall be designated by the President as Chairman of the Commission at the time of nomination. Each such member shall hold office for a term of six years; except that the terms of office of the members first appointed shall expire, as designated by the President at the time of nomination, as follows: One on January 1, 1958, one on January 1, 1959. one on January 1, 1960, one on January 1, 1961, and one on January 1, 1962. A vacancy in the membership of the Commission shall not affect the power of the remaining members to exercise the functions of the Commission, and shall be filled in the same manner as is the case of the original appointment. Not more than three members of the Commission shall be members of the same political party. The Chairman of the Commission shall receive compensation at the rate of \$20,000 per annum, and each of the other members of the Commission shall receive compensation at the rate of \$18,000 per annum.

"(b) Not less than three members of the Commission shall have general knowledge of commercial and sport fishing conditions and of the problems confronting the domestic and international fisheries.

"(c) In addition to exercising the functions transferred to it by this Act and otherwise provided by law, it shall be the duty of the Commission(1) to assist and advise the appropriate agencies of the several States which have the primary responsibility of managing fisheries, and any international agencies having similar official responsibilities, (2) to promote, conserve, and manage any fisheries in the Territories and possessions of the United States that remain the sole responsibility of the Federal Government, and (3) to construct, maintain and operate fish cultural stations relating to fish and shellfish, either independently or in cooperation with

State, Territorial, and private agencies, to the extent authorized by the Congress and by law.

"(d) It shall also be the duty of the Commission to prepare and submit to the Congress such programs, policies, and directives relating to the advancement, management, regulation, and protection of fisheries as the Commission deems necessary to carry out the purposes of this Act or as may be required by law,

"(e) The Commission shall conduct continuing studies, shall prepare and disseminate information, and shall make periodical reports and recommendations to the public, to the President and to the Congress, with respect to the following matters:

"(1) The production and flow to market of fish and fishery products domestically produced;

"(2) The production and flow to market of fish and fishery products produced by foreign producers which affect domestic commercial fisheries;

"(3) The trends in production of the various kinds of fish and shellfish;

"(4) The measures which are appropriate to assure the maximum sustainable production of fish and fishery products and to prevent unnecessary and excessive fluctuations in such production:

"(5) The measures that are necessary to prevent the excessive and harmful exploitation of the fisheries resources;

"(6) The methods and practices used in catching and taking fish and shellfish that are wasteful and that have the effect of diminishing the fisheries resources in the waters of the Continental Shelf and the high seas;

"(7) The competitive economic position of the various fish and fishery products with respect to each other and to competitive fish and fishery products produced by foreign producers;

"(8) The market conditions, amount of production, and general economic position of fish and fishery products in the countries in which such products constitute an important part of the food supply; and

"(9) Any other matters which in the judgment of the Commission are of public interest in connection with any phases of fisheries operations,

"(f) The Commission shall cooperate to the fullest practicable extent with the Secretary of State in providing representation at all meetings and conferences relating to fisheries in which representatives of the United States and foreign countries participate. The Secretary of State shall, whereever possible, designate at least one member of the Commission to the negotiating team in all matters relating to international fisheries.

"(g) The Secretary of State and all other officials having responsibilities in the fields of technical and economic aid to foreign nations shall consult with the Commission in all cases in which the interests of domestic commercial and sport fisheries are involved with a view to assuring that such interests are adequately represented at all times.

"(h) Notwithstanding any other provision of law, the Commission shall be represented in all international negotiations con-

ducted by the United States pursuant to section 350 of the Tariff
Act of 1930, as amended, in any case in which domestic commercial and sport fisheries are directly affected by such negotiations.

"(1) The Commission shall make such studies and investigations relating to fishing operations on the high seas as it deems necessary for the welfare and protection of domestic fisheries, and shall make reports and recommendations to the Congress and to the Secretary of State with respect to any practices, operations, or conditions or any other matters that it deems to be detrimental to, or vital to the security and welfare of, such fisheries...

"(k) The Commission may request and secure the advice or assistance of any department or agency of the Government, and any such department or agency which furnishes advice or assistance to the Commission may expend its own funds for such purposes, with or without reimbursement from the Commission as may be agreed upon between the Commission and the department or agency.

"(1) The Commission shall consult periodically with the various governmental, private nonprofit and other agencies which have to do with any phase of noncommercial fishing with respect to any problems that may arise in connection with such fishing.

"(m) The Commission may make such rules and regulations as it deems necessary to carry out the provisions of this Act, and all such rules and regulations shall be published in the <u>Federal Register</u> as in the case of those of any other agency. . . .

"Sec. 4. (a) There are hereby transferred to the Commission all the functions of the Department of the Interior (including the functions of the Secretary thereof and of the Fish and Wildlife Service) relating in any manner to fisheries, and the development, advancement, management conservation, and protection thereof,

"'(b) In addition, the functions of the Secretary of the Interior (1) relating to the protection of fur seals, and to the supervision of the Pribilof Islands and the care of the natives thereof; and (2) relating to the Whaling Convention Act of 1949 (Public Law 676, Eighty-first Congress) and any other functions of the Secretary relating to hair-seals, sea-lions, whales, and other mammals, are hereby transferred to, and shall hereafter be exercised by, the Commission,

"(c) There are hereby transferred to the Commission all functions of the Secretary of Agriculture, the Secretary of Commerce and the head of any other department or agency, which are now exercised by them or provided for under any Act of Congress and which relate in any manner to fisheries; but nothing in this subsection shall be construed to interfere with or modify the authority of the Department of State or the Secretary thereof to negotiate or enter into any international agreements or conventions with respect to the development, management or protection of any fisheries resources.

"(d) There are hereby transferred to the Commission so much of the personnel, property, facilities, records, and unexpended balances of appropriations, allocations and other funds (available or to be made available) as the Director of the Bureau of the Budget determines to be necessary in connection with the exercise of the functions transferred to the Commission by subsection (a), (b) and (c) of this section,

"Sec. 5. Close cooperation shall be established and maintained between the United States and Canada, and between the United States and Mexico, through fisheries agreements, in the interest of conserving and utilizing to the fullest practicable extent the stocks of food fish and shellfish which inhabit the waters of the Continental Shelf. Such cooperation shall also be established and maintained between the United States and other nations through fisheries agreements relating to the conservation and use of the stocks of food fish which inhabit the waters of the high seas,

"Sec. 6. Nothing in this Act shall be construed to interfere in any manner with the rights of any State under the Submerged Lands Act (Public Law 31, Eighty-third Congress) or otherwise provided by law.

"Sec. 7. (a) It shall be unlawful for any citizen of the United States---

"(1) to catch or take any salmon, trout, or other fishes on the high seas (except as authorized by the Commission for experimental or sport fishing purposes) with any form of net, gear, or other appliance which the Commission finds would prevent or interfere with the conservation of such fishes; and

"(2) to fish for or catch any species of shellfish in the waters of either the Atlantic Ocean or the Pacific Ocean by means of tangle nets or any other device or gear which the Commission finds would have the unavoidable result of taking immature and female shellfish at the same time that marketable male shellfish are taken.

"(b) The Commission is authorized to make such rules and regulations as may be necessary to enforce the provisions of this section,

MPORT QUOTAS: H. R. 9425 (Davis) introduced in the House February 20; a bill to regulate the foreign commerce of the Unite States by establishing import quotas under specified conditions and for other purposes; to the Committee on Ways and Means,

NITERIOR DEPARTIMENT APPROPRIATIONS; H, R, 9390 (Kirwan) introduced in the House February 17; a bill making appropriations for the Department of the Interior and related agencies (including the Fish and Wildlife Service) for the fiscal year ending June 30, 1957, and for other purposes; to the Committee on Appropriations, H, R, 9390 was reported to the House by the Committee on Appropriations on February 17 (H, Rept, 1772).

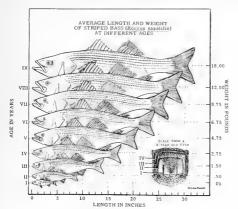
The House on February 21 passed H. R. 9390, making appropriations for the Department of the Interior and related agencies for fiscal year 1957, without amendment. The bill recommends appropriations for 1957 of \$415,963,200, which is\$10,785,000 under the budget estimates and\$78,067,573 more than the 1956 appropriations. The Fish and Wildlife Service was voted the full amount of the budget estimate.

TRADE COOPERATION ORGANIZATION MEMBERSHIP: H, R, 9413 (Springer) introduced in the House February 20; a bill to amend the Tariff Act of 1930 with respect to the administration of the General Agreement on Tariffs and Trade; to the Committee on Ways and Means. This bill will authorize the President to accept membership for the United States in the Organization for Trade Cooperation provided for in the Agreement on the Organization for Trade Cooperation arways are their ninth session,

HOW OLD IS YOUR STRIPED BASS?

One of the most essential facts needed in effective striped-bass management is the age composition of the population. Just as life insurance companies fix their rates according to the age distribution of humans, so the fish biologist must have such knowledge at hand in solving the many problems connected with the natural history and management of a fish species. Such problems as longevity, rates of growth, and age at maturity or spawning time may be wholly or partly solved by knowing the ages of various-sized fish that comprise a population. There are several indirect ways of doing this, but the simplest method is based on counting the annual rings deposited on the scales of fish, much like aging a tree by counting the exposed rings of the cross-section after it is cut.

The growth rate of fish varies far more than does that of a warm-blooded animal. This rate is directly and significantly affected by temperature, and by other physical and biological conditions. Thus it is possible for different age



classes or broods to be roughly the same size, or to have wide differences in average size. In fact, among legalsized older fish, it is not unusual to find very young individuals that have attained the same size more quickly. Based on studies of the age, length, and weight of striped bass carried out on the Atlantic and Pacific coasts, a graphic representation of average figures for ages I to IX is given on the accompanying illustration. From this you can hazard a guess of a fish's age, provided you know either the weight or the length.

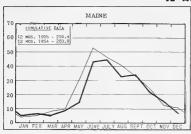
Biologists have collected a vast assemblage of statistics about striped bass. Weights and lengths galore have been collected for many years, since these two measurements can be determined with great accuracy. Weights of fishes are a function of the length; that is, the longer the fish grows, the heavier it becomes. Aging, on the other hand, is far from accurate after the eighth or ninth year. Even the experts differ among themselves in the interpretation of a particular fish's age. Larger "rock," of course, are even older. Those that are 40 inches long (averaging about 25 pounds) are about 11 or 12 years old; while 50 inches (about 50 pounds) are about 20 to 25 years old. One authority aged a striped bass that was 54 inches long, weighing 65 pounds, as either 29, 30, or 31 years old. One definite longevity record exists: a striped bass lived in the New York Aquarium for 23 years.

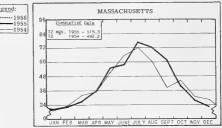
Among striped bass, a "dominant year-class" (i.e., a specific brood that occurs in a high numerical abundance within a fish population all out of proportion to "normal" occurrence) is determined from scale analysis and high density only after extensive scientific random samples are taken throughout the fishery. The biologist, in a sense, can predict from this sort of information whether "rock" will be available to fishermen in large, average, or small numbers. Notwithstanding extensive research into this phenomenon, the science of prediction based on dominant year-classes is at best in its infancy. Thus, although many unanswered questions plague the biologist, the aging process, at least, has helped to illuminate some of them.

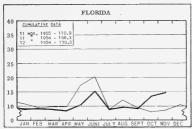


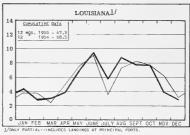
CHART I - FISHERY LANDINGS for SELECTED STATES

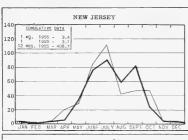
In Millions of Pounds Legend:











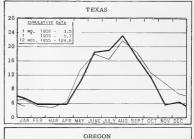






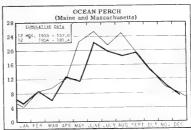
CHART 2 - LANDINGS for SELECTED FISHERIES



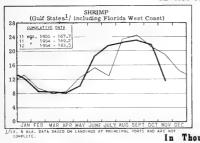
-1955

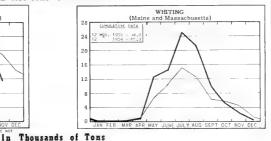
-1954

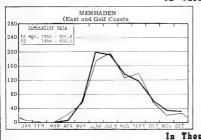


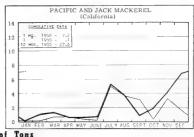


In Millions of Pounds













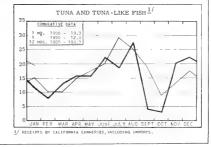
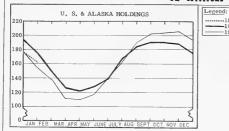


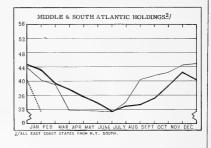
CHART 3 - COLD-STORAGE HOLDINGS and FRFEZINGS of FISHERY PRODUCTS *

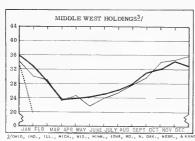


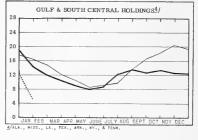


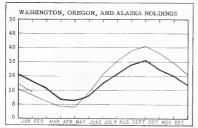








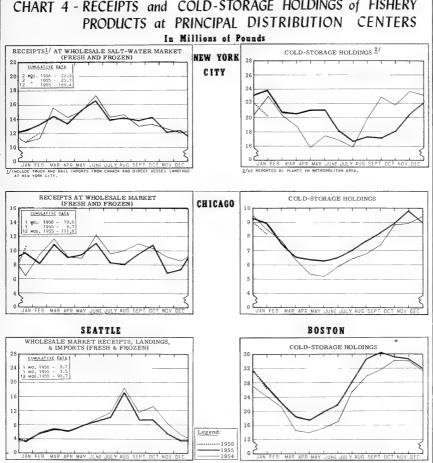






*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY



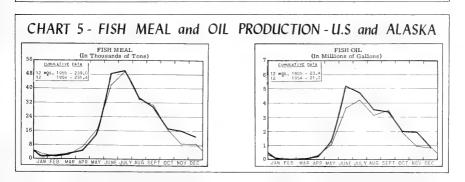
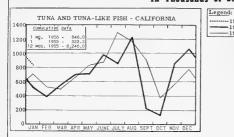
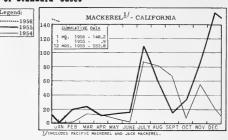
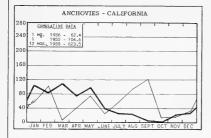


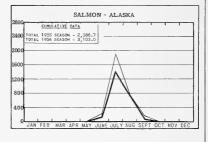
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



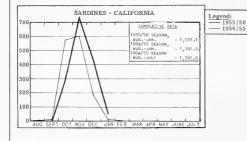






	SARDINES 1/ (ESTIMATED) - MAINE
1400	CUMULATIVE DATA
	HQS 1954 - 2,034.9
1000	
800-	
600-	
400	
200	
O JA	N FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1/ INCLU	DING SEA HERRING.

STANDARD CASES								
Variety	No. Cans	Can Designation	Net 1	₩gt.				
SARDINES	100	1/4 drawn	31/4	oz,				
SHRIMP	48		5	oz.				
TUNA	48	No. ½ tuna	6 & 7	oz,				
PILCHARDS	48	No. 1 oval	15	oz.				
SALMON	48	1-pound tall	16	oz,				
ANCHOVIES	48	½ lb.	8	oz.				



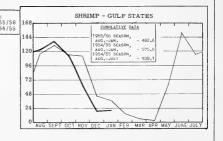
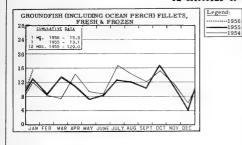
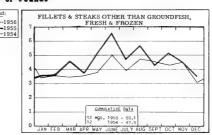
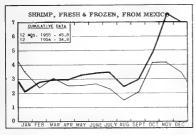


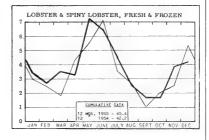
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

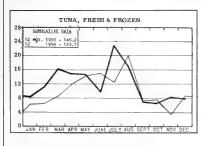
In Millions of Pounds

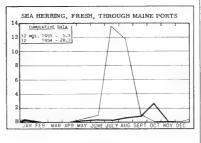


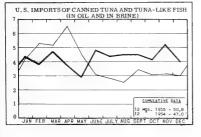
















FISH AND WILDLIFE SERVICE PUBLICATIONS

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CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA. - FISHERY LEAFLETS.

- STATISTICAL SECTION LISTS OF DEALERS IN AND PRO-DUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

MOL - MARKET DEVELOPMENT LISTS.

SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number Title CFS-1240 - Florida Landings, September 1955, 6 pp. CFS-1242 - Texas Landings, October 1955, 3 pp.

CFS-1243 - Frozen Fish Report, November 1955, 8 pp.

CFS-1244 - North Carolina Landings, October 1955, 2 pp.

CFS-1245 - New York Landings, October 1955, 4 pp. CFS-1246 - Mississippi Landings, October 1955,

2 pp. CFS-1247 - Maine Landings, October 1955, 3 pp. CFS-1248 - Fish Meal and Oil, October 1955, 2 pp.

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MDL-17 - Kansas Locker Plants, 13 pp.

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MDL-27 - Louisiana Locker Plants, 2 pp.

MDL-41 - Maine Locker Plants, 1 p. MDL-42 - Maryland Locker Plants, 2 pp.

Sep. No. 428 - Fish and Wildlife Service Aids Fishing Industry in Promoting Fishery Products in Columbus, Ohio.

Sep. No. 429 - Iron Sulfide Discoloration of Tuna

Cans - No. 2 - Analytical Methods. Sep. No. 430 - Research in Service Laboratories (February 1956): Contains these short articles-"Oxidative Deterioration in Fish and Fishery Products-No. 1;" "Composition of Fresh-Water Fish-No. 1;" "Lake Herring Samples Collected for Cold-Storage Studies;" "Weight Loss for Fish Sticks Stored at 0° to 5° F.;" "Crab Meat Federal Specifications."

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

The Gas Bladder and Its Relation to the Inner Ear in SARDINOPS CAERULEA and ENGRAULIS MORDAX, by Charles P. O'Connell, Fishery Bulletin 104 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 32 pp., illus., printed, 25 cents, 1955.

Survival and Spawning of Gill-Net-Marked Red Salmon, by Philip R. Nelson and Carl E. Abegglen, Research Report 40, 22 pp., illus., printed, 20 cents, 1955.

THE FOLLOWING PROCESSED PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1956, 4 pp., Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.

(Seattle) Monthly Summary - Fishery Products, January 1956, 4 pp. Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers. Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.

MISCELLANEOUS

PUBLICATIONS

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Annotated References Concerning the Effects of

Man-Made Sounds on the Movements of Fishes,
by James M. Moulton and Richard H. Backus, Fisheries Circular No. 17, 8 pp., printed. Department of Sea and Shore Fisheries, Vickery-Hill Bldg., Augusta, Maine, October 1955.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

- A Comparison Between Giant Bluefin Tuna (THUN-NUS THYNNUS) from the Straits of Florida and Gulf of Maine, with Reference to Migration and Population Identity, by Luis Rene Rivas, 17 pp., illus., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Seventh Annual Session, Havana, Cuba, November 1954.) The Marine Laboratory, University of Miami, Coral Gables, Fla.
- <u>Delaware Game, Fish and Dog Laws and Regula-</u> <u>tions, 1955-1956, 136 pp., printed. Board of</u> <u>Game and Fish Commissioners, Dover, Dela-</u> <u>ware.</u>
- The Development of the Pacific Herring Egg and its Use in Estimating Age of Spawn, by D. N. Outram, Circular No. 40, 11 pp., illus., processed. Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., December 1955.
- An Ecological Survey of Soldier Key, Biscayne Bay, Florida, by Gilbert L. and Nancy A. Voss, 27 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 5, no. 3, pp. 203-229, September 1955.) The Marine Laboratory, University of Miami, Coral Gables, Fla.
- From Trawler to Table (Certain Aspects of Deep Sea Fishing In India), by U. Shanker Rao, 327 pp., illus., printed, Rs. 8/-(US\$1.75).U. Shanker Rao, 25 A. Palit St., Ballygunge, Calcutta 19, India. Discusses concisely such aspects of India's fisheries as mechanization, economics of owner-skipper management, types of trawlers and fishing boats suitable for India, fishery research, the use of aircraft for aerial spotting, the manufacture of fish meal, and a blueprint for Indian middle-water fisheries. The author shows how foreign capital could be invested for a joint Indo-foreign fishing corporation, and suggests a modern trawler fleet for India's fisheries. Among the other subjects covered in the book are commercial fishing in postwar years, Japanese fishing in India, Japanese bull trawling, mothership and dory fishing, shark fishing, distribution of fish, fishery research in India, development of tuna fishing in India, fish markets, and finance,
- (Idaho) Twenty-Fifth Biennial Report of the Fish and Game Department, July 1952 to June 30, 1954, 79 pp., illus., printed. Idaho Department of Fish and Game, Boise, Idaho. Includes, among other items, reports on the Federal Aid in Fish Restoration projects and the fisheries management program. The latter discusses commercial fishing, principally for rough fish, in Idaho.
- Investigacion Pesquera (Fishery Investigations), vol. 1, 156 pp., and vol. 2, 178 pp., illus., printed in Spanish. Instituto de Investigaciones Pesqueras, Universidad de Barcelona, Barcelona, Spain, 1955.
- (Ireland) Report on the Sea and Inland Fisheries
 for the Year 1954 (incorporating Statistics of the Capture of Salmon, Sea Trout and Eels),

- 47 pp., printed, 2s. 6d. (35 U.S. cents). Government Publications Sale Office, G.P.O. Arcade, Dublin, Ireland. This report covers the activities of the Fisheries Branch of the Department of Agriculture, and includes statistics on the quantity and value of Ireland's sea and inland fish and shellfish catch for 1954; and other related data.
- (Kenya) Review of Kenya Fisheries, 1954, by Hugh Copley, 45 pp., illus., printed, 2s. (28 U.S. cents). The Government Printer, Nairobi, Kenya, 1955. Reviews the Kenya fisheries for 1954, with special reference to the river fisheries, hatchery work, a fish-culture farm, oyster research, crab survey, and marine fisheries. The report on the marine fisheries discusses production, prices, distribution and marketing, and exploratory and experimental work. It describes a study of markets; collection and disposal of shells in various forms; catching, preparation, and sale of turtles, crustacea, and beche-de-mer.
- Man and the Winds, by E. Aubert de la Rue (translated from French by Madge E. Thompson), 206 pp., illus., printed, US\$6. Philosophical Library, New York 16, N. Y. For the man who depends on the sea and waters for his livelihood and for those who handle the food products of the sea, lakes, and rivers, the story of the winds has always been a fascinating one. The author of this book points out that in the past the wind was used mainly in navigation and here man showed his greatest courage and ingenuity in making himself at once master and servant of this great force of nature. But there is still a lot to learn about the winds and their affect upon the ocean currents and consequently upon the fish and shellfish life in the waters of the earth. Although the affect of the winds upon mankind is adequately covered, including almost every sphere of human activity -- agriculture, forestry, biology, travel, sport, etc . -- its affect on fishing and the availability and processing of fishery and aquatic products is practically not mentioned. In one place the author does point out that in "Norway and Newfoundland the wind dries the fish which is hung up, placed on wicker trays, or spread out on the beach for this purpose. Some of the subjects covered include the types and names of winds; hurricane winds; wind as a determining factor of climate; the wind as a source of energy; sailing ships; the study of winds; and the mention of winds in mythology and legend. While in the past the wind has for centuries driven man's ships and turned his wind mills, the author points out: "Who knows whether, perhaps in the near future, we shall not be able to return to the use of the wind, almost completely neglected in our age, and to exploit its motive power in a more rational and effective manner than in the past?" The book contains a bibliography, which consists mostly of French references, and an index.

--J. Pileggi

Mullet Fish Sticks, by C. Isaac Camber, Report 55-35, 7 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., December 1955. A report to the Florida State

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Board of Conservation on a test, made in cooperation with the Southeastern Fisheries Association, with fish sticks made of mullet. Results of the tests showed that "Mullet sticks have a distinetive flavor which is stronger than that of cod, haddock or pollock sticks. This flavor is preferred by a substantial number of tasters, but more tasters questioned preferred the milderflavored fish, perhaps because of greater familiarity with this type. The appearance of mullet sticks, especially the dark streaks in the meat, make this product less attractive to the buyer. Mullet fish sticks cannot be stored for protracted periods due to their high oil content. Low wholesale and retail prices, competitive with fish sticks made of fish obtained from northern waters, and a vigorous industry promotion campaign are necessary to introduce mullet fish sticks into the present market.

(New Zealand) Report on Fisheries for 1954, 38 pp., printed. Marine Department, Wellington, New Zealand, 1955. A report on the fisheries of New Zealand which discusses crayfish, fishing vessels and personnel, fish landings, methods of capture, landings by ports, exports and imports, fish-liver oil, whaling, oysters, whitebait, mussels, fresh-water fisheries and research, marine research, and legislation. Included also are statistical tables giving detailed data on the fisheries.

"Races of the Striped Bass, Roccus saxatilis (Walbaum), in Southeastern United States," by Edward C. Raney and William S. Woolcott, article, The Journal of Wildlife Management, vol. 19, no. 4, October 1955, pp. 444-450, illus., printed, single copy \$2. The Wildlife Society, 113 East Green St., Ithaca, N. Y.

II Reunion Sobre Productividad Y Pesquerias (Second Meeting on Productivity of the Ocean and Fishery Exploitation), 121 pp., processed in Spanish. Instituto de Investigaciones Pesqueras, Barcelona, Spain.

Scandinavian Fishing Year-Book (Year-Book and Directory for the European Fish Trade), 1955, edited by Robert Eddy, 272 pp., plus 16 colored plates, illus., printed, 50 Danish kroner (US\$7, 50). Willy Rose, 59-61 Nyham, Copenhagen K, Denmark. A handy yearbook for those dealing with the fisheries of Scandinavian countries. It is particularly valuable to exporters and importers. An unusual feature of the book is the 16 colored plates depicting the various species of fish caught in Scandinavian waters or landed by Scandinavian fishing vessels and a name index in Latin and 15 other languages, including Danish, Dutch, English, Faroe, Finnish, French, German, Icelandic, Italian, Norwegian, Polish, Portuguese, Russian, Spanish, and Swedish.

The Norwegian section contains articles on Norway's coast fisheries, vocational training for fishermen, deep-sea fishing, achievements in oceanography, increasing use of refrigeration, the herring oiland herring meal industries, sealing, exports of salt fish, salted herring,

cod-liver oil, stockfish, export of iced fresh herring and iced fresh fish, frozen fish fillets, klipfish, the Norwegian sales organizations, the fishing fleet, and a list of Norwegian fishery products exporters and advertisers.

The Danish section includes articles on Denmark's fishing industry in 1953, the Danish fishery administration and control of fishing, commercial trout farming, the technological laboratory of the Ministry of Fisheries, the Danish Fisheries Act of Quality Control with fish and fish products, the inspection of industrial products, quality control on the Farce Islands, oyster fishing in Limfjorden, Danish fishery products exports in 1952, and a list of Danish exporters.

The section on Sweden contains articles on the Swedish canning industry, the fisheries of Sweden in 1952, and a list of Swedish associations and exporters.

Included also is a list of Dutch advertisers; German advertisers; an index of European importers and exporters, including Austria, Belgium, Bulgaria, Czechoslovakia, Finland, France, Germany, Great Britain, Greece, Holland, Hungary, Iceland, Ireland, Italy, Malta, Poland, Portugal, Spain, Switzerland, Yugoslavia. Also included is a list of importers and exporters in Africa, Asia, Australia, the United States, Canada, Central America, and South America.

Shrimp Prospecting in the Offshore Region of the British Columbia Coast, June to August, 1955, by T. H. Butler and G. V. Dobokovic, Circular No. 39, 24 pp., illus., processed. Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., November 1955. This circular describes results of a program conducted in the offshore region of the British Columbia Coast.

Transactions of the American Fisheries Society, 1954 (Eighty-Fourth Annual Meeting, Seattle, Wash., September 13, 14, 15, 1954), vol. 84, 436 pp., illus., printed, \$4.50. American Fisheries Society, Ann Arbor, Mich. (Order from Howard A. Tanner, Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo.) Part I consists of the papers presented at the Eighty-Fourth Annual Meeting of the Society. The following are some of the papers presented: "The Effects of Temperature and Predators on the Abundance of the Soft-Shell Clam, Mya arenaria, in New England, by John B. Glude; "The Reproduction of Lake Trout in Southern Lake Superior," by Paul H. Eschmeyer; "The Effect of Some Sulfonamides on the Growth of Brook Trout, Brown Trout, and Rainbow Trout," by S. F. Snieszko and E. M. Wood; "Sulfonamide Toxicity in Brook Trout," by E. M. Wood, W. T. Yasutake, and S. F. Snieszko; and "The Pygmy Whitefish, <u>Coregonus coulter</u>; in Lake superior," by Paul Eschmeyer.
Part II contains panel discussions on problems of the commercial fisheries, and Part III reports on the business sessions of the Society.



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Editorial Assistant -- Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Helen Joswick

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Page 10--H. L. Seagran; p. 25--J. Pileggi; pp. 30, 31, & 33--Food and Agriculture Organization; Cover and pp. 37 & 38--Protectorate de la Republique Francaise au Maroc; p. 45--"Norway Fisheries and Fish Processing."

MARKET FORMS OF FISH

Fresh and frozen fish may be bought in a variety of cuts, the more important of which are shown here. Knowing the cuts and their particular uses is important in buying or selling fish. The edible portion varies with the type of cut, from 100 percent for fillets to about 45 percent for whole fish.



Wade or round fish are those marketed just as they come from the water. In this form, the edible portion is about 45 percent of the whole, but varies with size and kind of fish. To prepare for cooking, fish should be sealed and evicerated and, if desired, head, tail, and fins should be removed. Fish them may be used for baking, or may be siliced, dileted, or cuit not steaks or chunks. Small fish, like smelt, are often cooked with only the entrails zeroused.



Steaks are cross-section slices of the larger sizes of dressed fish, usually about ¼ of an inch thick. In this form the edible portion is about 84 percent. Steaks are ready to cook as purchased.



Drawn fish are those marketed with only the entrails removed. In this form, the edible portion is about 48 percent, but varies with size and kind of fish. To prepare for cooking, they are generally scaled. Head, tail, and fins may be removed, if desired, and the fish split, filleted, or cut into steaks or chunks.



Fillets are the sides of fish cut away from the backbone. They are practically boncless and have little or no waste. Fillets are ready for cooking. The skin may be left on or may be removed. A fillet cut from one side of a fish is called a single fillet. This is the type most generally seen in the market.



Dressed fish are scaled and eviscerated, usually with the head, tail, and fins removed. Edible portion in this form is about 67 percent, but varies with size and kind of fish. The smaller sizes are ready for cooking as purchased (pan dressed). The larger sizes may be baked as purchased or may be cut into fillets, steaks, or chunks.



Butterfly fillets are the two sides of the fish corresponding to two single fillets held together by the uncut flesh and skin of the belly.

Sticks are pieces of fish cut lengthwise or crosswise from fillets into portions of uniform width and length, usually about 1 inch wide and 3 inches long.

MARKET FORMS OF SHELLFISH

Some shellfish are marketed alive. Other market forms, depending on the variety, include cooked whole in the shell, fresh meat (shucked), headless, and cooked meat.



In shell: Shellfish, such as hard and soft blue crabs, lobsters, clams, and oysters should be alive if bought fresh in the shell. Crabs and lobsters may also be cooked in the shell. Edible portion varies widely.



Headless: Only the tail part of shrimp is commonly marketed. Spiny-lobster tails are also a common market form. About 85 percent is edible.



Shucked: Clam, oyster, and scallop meats may be bought free of the shell, commonly known as shucked. In this form the portion is 100 percent edible.



Cooked meat: The edible portion is picked from the cooked shellish. Crab, shrimp, and lobster meat is marketed in this way. Cooked meat is perishable, although packaged in containers, since it is not further processed by heat. It is 100 percent edible.

--Fresh and Frozen Fish Buying Manual, Circular 20, Fish and Wildlife Service. 1 14463X 15hes moint il sibbs du

COMMERCIAL DEVIEW



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APRIL 1956

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JOHN L. FARLEY, DIRECTOR



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U.S. Department of the Interior, Washington 25, D.C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/31/57)

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CORRECTION: February 1956, inside cover page, legend for cover photo should have stated: "The annual ex-vessel value of sea-scallop landings is about \$10 million,"

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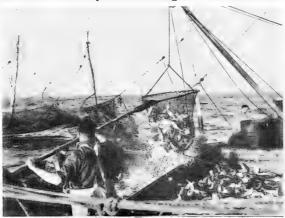
CONDITION OF THE MIDDLE ATLANTIC POUND-NET FISHERY

By Fred C. June*

BACKGROUND

For over 100 years pound or trap nets were one of the principal means of exploiting the various migratory food fish stocks which inhabited the shallow waters along the middle Atlantic Coast during the warm months of the year. More recently, however, this gear has become of minor importance among the commercial fish-

eries within this region, and in some localities it has disappeared completely. Of the 14 fishing companies which operated an estimated total of 45 pound nets in the vicinity of Ocean City, Md., during the 1920's, there is not a single one remaining. In August 1953 the last nets fishing in the vicinity of Wildwood, N. J., were taken from the water. For many years five pound-net companies operated out of Sea Isle City, N. J. By 1954 their number had been reduced to three. It is of interest, biologically and economically, to consider the possible factors which have contributed to this condition.



Taking fish from a pound net in Chesapeake Bay using a dip net operated by the power winch aboard the vessel.

LANDINGS INDICATE CHANGE IN YIELD

Although not completely documented, published records of total yield furnish a rough measure of the change which has taken place in the pound-net fishery in the middle Atlantic region (table 1). In 1939 pound nets accounted for roughly 25 percent of the total fish production in New York and New Jersey. In 1951 this gear contributed less than 14 percent of the catch in those states. In figure 1 are plotted combined landings for New York and New Jersey for the period 1939 through 1951. It may be seen that, apart from annual fluctuations, a downward trend in catch had its beginning in 1944 when the catch dropped $8\frac{1}{2}$ million pounds, or nearly 20 percent, below that of the preceding year. By 1949 the catch was only one-half that reported 10 years earlier. From table 1 it may be seen that this trend was but a * Chief, Menhaden Investigations, Branch of Fishery Biology, U. S. Fishery Laboratory, Beaufort, N. C.

reflection of the condition of the New Jersey fishery which in 1944, similarly, showed a 20-percent decrease in yield. The most significant change in the New York fish-

Table 1 - Pound-Net Landings in New York and New Jersey, 1939-1951						
Year		New Jersey	Total			
		(1,000 Lbs.).				
1951	4,906	40,093	44,999			
1950	3,026	15, 127	18, 153			
1949	2,848	21,993	24,841			
1948	2,915	24, 170	27,085			
1947	3, 403	28,724	32, 127			
1946	5,647	1/	1/			
1945	6,646	30,684	37, 330			
1944	5,753	30,948	36,701			
1943	6,402	38,880	45, 282			
1942	6, 197	37,611	43,808			
1941	1/	1/	1/			
1940	8, 383	30, 229	38,612			
1939	7, 327	39, 107	46,434			
1/ Data unavailable.						

ery during this period occurred in 1947 when the catch fell below $3\frac{1}{2}$ million pounds, or less than 40 percent of the previous year. The downward trend continued in both states until 1951. The marked increase in yield in that year was attributable to increased landings of menhaden (Brevoortia tyrannus). This species alone accounted for over two-thirds of the catch in 1951 and roughly three-fourths of the annual catches from 1952 through 1954. 1/2

While a downward trend in poundnet production was evident in the entire middle Atlantic region commencing about 1944, the decline was most precipitous in certain restricted coastal areas. In figure 2, for example, are

plotted pound-net landings at Ocean City, Md., from 1944 through 1953. Apart from annual fluctuations, most significant, perhaps, was the sudden drop in 1951 when the catch fell below 100 thousand pounds, or about one-twentieth of that reported seven years earlier. The 1953 catch amounted to only a few thousand pounds, and in August of that year the nets and pilings were removed from the water.

SPECIES COMPOSITION OF THE POUND-NET FISHERY

The decline in importance of the pound-net fishery in the middle Atlantic region, variously, has been attributed to a decrease in abundance of the migratory food-fish stocks, changes in hydrographic conditions which adversely have affected availability, pollution in our coastal waters, competition from other gears, such as the otter trawl--to mention but a few diagnoses.

Discussions with pound-net operators and examination of their catch records suggest, however, that this decline in importance was due primarily to the downward fluctuations in availability or abundance of the valuable food-fish stocks upon which the fishery was dependent. For example, from 1939 through 1951 about a dozen species accounted for over 95 percent of the annual pound-net production in this area. Although the individual species rank often shifted markedly from year to year, some of the more important food fishes included: butterfish (Poronotus triacanthus), gray sea trout or weakfish (Cynoscion regalis), porgy or scup (Stenotomus versicolor), whiting (Merluccius bilinearis), croaker (Micropogon undulatus), and mackerel (Scomber scombrus).

In table 2 are given the pound-net landings of these selected species in New York and New Jersey during the period 1939 through 1951. It may be seen that in 1939 their combined yield amounted to nearly 39 million pounds, or about 62 percent of the total pound-net production in these states. However, in 1951 they accounted for slightly over 7 million pounds, or roughly 16 percent of the catch. Although a downward trend is evident for all 6 species, most significant, perhaps, was the sudden drop in landings of croaker in 1945 and a similar decline of scup, whiting, and mackerel in 1947. By 1947 butterfish landings also had decreased by by nearly 7.5 million pounds from the 1939 level. During the period 1939 through 1945, the combined annual yield of croaker, whiting, and mackerel averaged over 1/Estimates for 1952-54 based on incomplete records.

10.5 million pounds. However, from 1947 through 1951, their combined yield averaged slightly over one million pounds.

In contrast to the downward trends of these valuable food fishes, there has been a steady increase in landings of unremunerative food species and industrial fish.

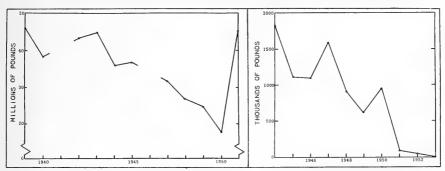


Fig. 1 - Pound-net landings, New York and New Jersey, 1939-1951.

Fig. 2 - Pound net landings, Ocean City, Md., 1944-1952. (Source: Maryland Board of Natural Resources, Department of Research and Education.)

For example, in 1939 pound-net landings of menhaden in New York and New Jersey amounted to slightly over 8.5 million pounds, or less than

19 percent of the catch. In 1951 landings of this species totaled over 32 million pounds, or 72 percent of the catch (table 2).

	Table 2 - Pound-Net Landings in New York and New Jersey of Selected Species, 1939-1951															
Year	Butterfish	Croaker	Scup	Weakfish	Whiting	Mackerel	Total Food Fish	Menhaden								
1951	3,762	- 1	1,621	927	586	149	7,045	32,298								
1950	370	1	1,268		416	357	3,062	10,812								
1949	1,293	5	1,109	1,096	467	777	4,747	13, 352								
1948	948	144	1,552	1,562	256	505	4,967	16,082								
1947	1,029	632	616	4,062	1,915	297	8,551	13,508								
1946	1/	1/	1/	1/	1/	1/	1/	1/								
1945	$2,\overline{7}36$	$\frac{1}{496}$	1, 104	$3,\overline{600}$	$6,\overline{3}29$	$\frac{1}{2,515}$	16,780	$11.\overline{573}$								
1944	2,917	2,142	1,458	2,124	3,751		16, 223	12,338								
1943	6,060	2,518	2,402	2,413	5,753	1,804	20,950	13,540								
1942	2,934	2,653	2,567	3,536	5,848	2,418	19,956	11,515								
1941	1/	1/	1/	1/	1/	1/	1/	1/								
1940	$5,\overline{9}90$	2,969	1,810	$2.\overline{958}$	5, 950		22,002	5, 877								
1939	8,483	3,070	1,874	5,488	7,087		28, 865	8,638								
1/ Data ii	ncomplete or unav	ailable.														

Figure 3 is a recapitulation of the change in species composition which has taken place during the period 1939 through 1951. Arbitrarily included among the so-called "trash" and industrial fish are menhaden, cusk (Brosme brosme), skates (families Rajidae, Dasyatidae, and Rhinopteridae), sea robin (Prionotus sp.), herring (Clupea harengus), squirrel hake (Urophycis chuss), white hake (Urophycis tenuis), sharks (families Sphyrnidae, Carcharhinidae, Alopiidae, Carchariidae, and Isuridae), anglerfish (Lophius americanus), tautog (Tautoga onitis), conger eel (Conger oceania), wolffish (Anarhichas lupas), swellfish (Sphaeroides maculatus),

alewife (<u>Pomolobus pseudoharengus</u>), dogfishes (families Squalidae and Triakidae), kingfish (<u>Menticirrhus saxatilis</u>), pilotfish (<u>Naucrates ductor</u>), squid (<u>Loligo pealii</u>), and horseshoe crab (<u>Limulus polyphemus</u>). It may be seen that the percentage composition of the above listed species has risen nearly threefold over the 13-year

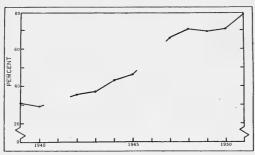


Fig. 3 - Pound-net landings of industrial fish in New York and New Jersey, 1939-1951--percentage of total pound-net landings.

period. Also, it must be noted that the quantities of these species by no means are proportional to their occurrence in the catches. If there is no immediate market for these fishes, usually, they are discarded at sea or at the landing docks and, thus, are not accounted for in catch records. Industrial, nonfood, and other low-priced fish provide additional income during good seasons of valuable food-fish production, but the pound-net fishery cannot be maintained on the basis of these alone.

CAUSES OF FLUCTUATIONS

Causes of the fluctuations in availability and abundance of these various fish stocks are little understood. Unfortunately, the biology and life histories of many of the migratory species which support our coastal fisheries are too imperfectly known to permit the application of intelligent measures for their management and maximum utilization. Whether the simultaneous decline of the several important food species was due to adverse environmental conditions during certain stages in their life histories, or whether overfishing was responsible, are propositions which cannot be answered in the light of present biological knowledge. The influence of environmental factors on behavior and migrations, the interrelations of the various species on the summer feeding grounds, and the abundance of the various species populations in relation to their fisheries can only be surmised at present. However, these factors must be considered if the problem of fluctuations is to be understood.

Of further significance has been the increased importance of mechanized gears, such as the otter trawl, which exploit the same fish stocks as the pound nets. In 1939, for example, there were 194 resident trawl vessels operating in the middle Atlantic area. Eight years later their number had risen to 337. Competition from this more efficient gear probably has had a depressing effect on pound-net production. During seasons when food fish were abundant, pound nets were able to compete effectively with the draggers, and the fishermen enjoyed a profitable share of the catch. However, during periods of scarcity, pound-net fishermen were unable to adjust their operations to changing conditions in the fishery. As a result, many have been forced either to operate on a marginal level of profit, or stop fishing. On the other hand, the more versatile trawl fishermen were able to successfully adjust their fishing activities to the seasonal and long-term changes in availability and abundance of various species and, thus, have been able to operate at a profit. Furthermore, progressive changes in fishing methods and equipment have increased the efficiency of the trawl fleet.

Introduction of the electronic depth-recorder and the radiotelephone have opened up new fishing grounds for the trawlers and increased valuable fishing time. In contrast, few improvements have been inaugurated either in the operation or construction of pound-net gear. The large 25- to 30-pole rigs still require 7 to 9 men on a basis of 3 or 4 hours work each day over 6 or 7 months of the year. It is unlikely that any commercial fishery could operate profitably on a labor expenditure

of less than one-quarter day per man, especially during periods of low fish abundance. Smaller units of gear could be operated more efficiently and economically.

Rigs with 8 to 10 poles and minimum-sized pockets could be handled by 2 or 3 men, thus reducing operating costs and increasing the per capita return. Smaller units also would enable the fishermen to operate more gear and thus permit fishing to be extended over a greater area. Finally, smaller nets prob-



Trawlers or draggers tied up for unloading at Hampton, Va.

ably would survive storm damage more effectively and thus permit their operation over a longer period of the year.

CONCLUSION

What about the future?

There are indications that several of the migratory food-fish populations are on the increase along the middle Atlantic Coast. Total landings of scup, bluefish (<u>Pomotomus saltatrix</u>), fluke (<u>Paralichthys dentatus</u>), gray sea trout showed an increase in 1953 and 1954. However, there is no assurance that an increased abundance of these species would be of direct benefit to the pound-net fishery. Unless the factor of availability operates favorably, the pound-net fishermen face an uncertain future.



HAND TONGS USED TO HARVEST OYSTERS IN FLORIDA

The legal mechanical device for the taking of oysters in Florida is the hand tongs. This consists of two modified rakes, joined

by a pivot located about one-third of the way between the rake and the shaft ends. The teeth range in number from 10 to 14, and serve to tear the oyster free from the bottom attachment. A basketlike enlargement of the teeth serves to hold large numbers of oysters until they can be brought to the sur-

face. Tongs used in Florida range from 10 to 16 feet long.

Tongs are lowered in the water in the open position, with the shaft ends three to four feet apart. When the rake reaches the bottom the oysterman works the shafts back and forth until he can close the tongs by bringing the shafts together. The tongs are then hauled, hand over hand, to the surface and the oysters are released on deck.

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

SCHOOL LUNCH FISH-COOKERY DEMONSTRATIONS IN OKLAHOMA

By Robert P. Seifert*

A series of fish-cookery demonstrations for the lunchroom personnel of the Oklahoma schools was presented during the spring of 1954 by the U. S. Fish and Wildlife Service. A total of 36 demonstrations were given in cooperation with the Oklahoma School Lunch Division and the U. S. Department of Agriculture, for 1,600 managers, cooks, and workers representing 632 schools throughout the State. Nearly 120,000 children are fed daily in these schools, which have a total enrollment of over 220,000.

The purpose of these demonstrations was threefold: (1) to encourage greater use of fishery products in the school lunchrooms of the State, (2) to show lunchroom personnel improved or varied methods of preparing fish, and (3) to encourage use of a wider variety of fishery products.

To determine the effectiveness of these demonstrations in achieving these objectives, a survey was made of the use of fish in the schools before and after the



Today's children are tomorrow's consumers. Encouraging the use of fishery products in school-lunch programs will yield dividends in the future.

demonstrations. The month of October was chosen as a representative period for the survey. Accordingly, individual school menus on file in the State School Lunch Division office were checked for October 1953 (a sample month before the demonstrations). The menus for 359 schools which had personnel attending a fish-cookery demonstration, and 205 schools not represented at any demonstration, were checked. The 205 schools not represented were used as a control in the survey.

Similar demonstration programs in many other states have

increased the use of fish in schools approximately 50 percent. However, the results in Oklahoma did not follow this trend. As shown in Table 1, Oklahoma schools represented at the demonstrations showed a decrease of 8 percent in their frequency of fish use after the demonstrations. In October 1953, which was before the program began, it was found that their use of fishery products averaged 1.3 times per month--about the same as the schools of most inland states which have had no special encouragement to use fish in their lunchrooms. In October 1954, or after the program was completed, their use of fish was only 1.2 times per month.

However, in making the survey, the use of fish in schools not represented at the demonstrations, and presumably not otherwise influenced in their use of fish, was also checked. It was found that for the same comparative periods, as shown in Table 1, their use of fish had declined 28 percent, i.e., from 1.1 times per month to 0.8 times per month.

The decline in the quantity of fish consumed, computed on the basis that one serving of fish contains approximately 2 ounces, was practically the same as the frequency of use. It should be noted here that the smaller average poundages of *Fishery Marketing Specialist, formerly with the Educational and Market Development Section, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C.

fish shown consumed by the schools not represented, as compared to those which were, is caused by a difference in the size of the schools in the two groups. Since practically all of the larger schools were represented at one of the Service demonstrations, it was necessary in the control group to use schools which were, on the average, smaller in size.

Table 1 - Results of Oklahoma School Lunch Fish-Cookery Demonstrations									
	Average Amount of Fish								
Item	Per	Month P	er School	Used Per Month Per School					
Item	Demonstration		Percentage	Demonstration		Percentage			
}	Before After		Change	Before	After	Change			
	No.	No.	<u>%</u>	Lbs.	Lbs.	%			
For Schools:									
Represented	1.3	1.2	- 8	28.0	26.1	- 7			
Not Represented	1.1	. 8	-28	18.4	13.1	-29			

Because the declines in the use of fish after the demonstrations were so unusual, it appeared likely that there must be some other factors which had influenced the choice of menus in the Oklahoma schools during the period surveyed after the demstrations of fish cookery.

The Oklahoma School Lunch Program Director and his supervisors stated that the reason for the general decline in the use of fish in the schools was because of the large quantity of beef, beans, and cheese which had been distributed to the schools in the fall of 1954. This distribution of free protein-rich food was so ample that the schools could, if they chose, virtually eliminate the buying of any other "main dish" ingredient. Data obtained from the State Director of Commodity Distribution bore out the comments of the School Lunch Director and supervisors. A total of \$213,034 worth of beef, cheese, and beans were distributed free to the Oklahoma schools during August, September, and October of 1953. However, in the same months of 1954, \$650,043 worth of beef, cheese, and beans were distributed in this three-month period. Thus, triple the amounts of free commodities were available to the schools from the Department of Agriculture. The distribution of beef alone in August, September, and October of 1954 was nearly three times as much as all of the commodities distributed in the first three months of the 1953 school year. Under these circumstances it is somewhat surprising that the schools used as much fish as they did in 1954. The fact that the decline in the use of fish was held, in those schools represented at a demonstration, to only 8 percent is indicative of the value of the demonstrations to the schools, especially since nonrepresented schools showed a 28-percent decrease in their use of fish or a 2.5 times greater decline than the first group of schools.

Influencing the frequency with which fish is used in the schools is not the only purpose of the demonstrations. Various methods of preparation are also demon-

strated. In the Service's demonstrations, emphasis is placed on methods by which fish can be prepared in the oven, since schools usually have more oven space than they have top-of-the-stove space as would be needed for pan-frying fish. It was noted in the survey that preparation of ovenfried fish proportionately tripled and baked fish doubled in those schools represented at a demonstration.

Table 2 - Relative Use of Fish, October 1954						
Species	Percent					
Salmon, canned	38					
Tuna, canned	32					
Fillets, frozen	29					
Mackerel, canned	1					
Total	100					

In the demonstrations, the use of both canned and frozen fish is shown. Canned salmon and tuna, frozen fillets (principally ocean perch and cod), and canned mackerel, in that order, were found to be most popular in the Oklahoma schools before the demonstrations and remained in that order of popularity afterwards. However, an increase in the use of frozen fillets was noted as an apparent result of the work

done. This is understandable since the people of inland areas are often found to be a little skeptical of frozen fish unless some extra effort is made to point out the advantages for using the frozen product. Table 2 shows the percentages of various kinds of fish chosen for their menus by the Oklahoma school lunch managers in October 1954.

Table 3 - P								
Serve	Served Per Day							
Day		_			Percent			
Monday					9.6			
Tuesday .		۵			10.5			
Wednesday					11.7			
Thursday .					11.7			
Friday					56.5			
Total					100.0			

Friday is still "fish day" in the Oklahoma schools. Fish are served more often on that day than on all the other days combined (table 3).

In this summary of the fish-cookery demonstrations in Oklahoma, the State School Lunch Division should be given special credit for the excellent cooperation which all of its personnel extended to the Service's Home Economist and Fishery Marketing Specialist conducting the demonstrations and survey in the

State. Credit should also be given the School Lunch Division personnel for their efforts in following through on the material presented at the demonstrations. At their annual workshops, and in their monthly bulletins, they have consistently included mention of fishery products. Fish can reasonably be expected to enjoy much greater use in Oklahoma as a result of the State's and Service's work whenever beef and other protein-rich foods are not so amply distributed as free commodities.



BLACK PEARLS

A Kobe, Japan, pearl dealer, after several years of experiments, recently announced success in a process by which light pearls are made black. His process remains secret but it is understood to be based on his discovery that the core and the outer layers of pearls have different heat expansion coefficients. The outer layers are loosened from the core substance under heat after which a pigment is forced into a small hole drilled in the pearl. The pigment seeps evenly between the core and the outer layers of the pearl. It is claimed that the pearl thus treated does not lose its lustre. The Kobe dealer reports that European dealers have responded enthusiastically to the new product.

--U. S. Consulate Dispatch, Kobe, Japan, July 8, 1954.



A POSSIBLE QUALITY INDEX FOR FISH MEAL

Both producers and users of fish meal need a quick laboratory method to indicate the relative nutritive value of fish meals. At present variations in the nutritive value of meal as affected by raw material, processing, and storage variables are best determined by animal-feeding tests requiring from 10 days to several weeks to complete. The possibility of developing a chemical method for this purpose is being studied at the Service's Seattle Technological Laboratory.

One phase of the project is a study of the dye-adsorption properties of the protein in fish meal in relation to the nutritive quality. Although investigations of this type have been reported for vegetable protein, no definite method has been reported that might be used as a quality index for fish meal. Thus, the first step was to develop a technique.

After testing dyes representative of the major types, four dyes have been shown to be promising. These were orange G and orange II in acid solutions and congo red and tetrabromophenol blue in alkaline solutions. With this phase completed, exploratory work is being done on the adsorption by meals prepared from a number of species of fish. The results of the dye-adsorption tests will be compared with results of chick-feeding tests run by collaborative workers. These comparisons will determine whether any correlation exists between the nutritive value of the fish meal and the dye adsorption by the protein in the meal.

PROGRESS REPORT ON PROCESSING AND HANDLING SOUTHERN OYSTERS

The development of new processing methods to improve the quality of Louisiana oysters is being conducted at the Louisiana State University with funds provided by the Saltonstall-Kennedy Act of 1954. In recent tests they found that oysters packaged in cartons and overwrapped, frozen at $^{\rm O}$ F. and stored at $^{\rm O}$ F., are a very acceptable product after 6 months of frozen storage. Storage beyond 6 months resulted in the development of rancidlike odor and flavor and surface oxidation and discoloration.

Oysters that were packaged in cartons, frozen, and then glazed were an acceptable product after 8 months of storage at 0° F. From these results it appears that the ice glaze protects the surface from oxidation and discoloration.

Of all the methods of packaging which were tried, oysters which were vacuum-packed, frozen, and stored at 0 $\,^{\circ}$ F., resulted in the best product. After 4 months of storage, taste-panel scores for this product were higher than for other methods of packaging. They were also less fragile after thawing.

The effects of washing on the quality of oysters were also studied. Investigation revealed that oysters washed in a 0.65-percent salt solution and glazed or frozen in this solution produced slightly less drip upon thawing during the first 6 months of storage than oysters washed in the salt solution and glazed with water. Washing with or glazing with a salt solution instead of water resulted in slightly higher salt content in the oyster meats, but they had a better flavor, perhaps because of the higher salt content.



PUBLIC MEETINGS ON FISH STICK STANDARD

Fishery officials of the Fish and Wildlife Service held a series of public conferences in eight key cities from March 2 to April 5 to consider proposed standards for grading frozen fried fish sticks.

As an important part of its technological research program, the Service has been engaged for some time in the development of voluntary Federal standards for



Packing fried fish sticks in 8-oz, paper cartons in a leading fish-stick plant in Boston, Mass.

fishery products. Service technologists, with the active cooperation of the fish-stick producers, have prepared the provisional draft of a voluntary standard. This is now ready for consideration by those who will be concerned with the application of the standard when it goes into effect.

In addition to producers of frozen fish sticks, these meetings were of interest to raw-material suppliers, transportation agencies, cold-storage operators, wholesalers, retailers, and consumer groups, as well as the trade associations operating in these fields.

The meetings were opened with a very brief statement of the background of voluntary Federal standards, how they

are being developed for fishery products, and who can use them to advantage. Comments from those in attendance were summarized by the Service representative presiding. Subsequent comments from the floor were likewise summarized. These discussions indicate what changes, if any, are needed in the standard.

Scheduled meetings were held in New York, N. Y.; Atlanta, Ga.; Dallas, Tex.; Los Angeles, Calif.; Seattle, Wash.; Chicago, Ill.; and Boston, Mass.; and Washington, D. C.

This project for the development of voluntary standards for fishery products is being financed by funds available through the Saltonstall-Kennedy Act which was passed in 1954 to help the free flow of domestic fishery products into the channels of trade.





Additions to U.S. Fleet of Fishing Vessels

A total of 17 vessels III S Vessels Issued First Documents as Fishing Craft of 5 net tons and over were issued first documents as fishing craft during January 1956, according to the U.S. Bureau of Customs. This was 1 vessel less than the number reported for January of last year.

The Chesapeake area led all others during January 1956 with 5 newly-documented craft, followed by the South Atlantic area with 4, the Gulf area with 3, the Middle Atlantic area with 2, and

o. 5. Vessers issued First Documents as Fishing Craft,									
January 1956 and Comparisons									
Area	January	Total							
Area	1956 1955	1955							
	(Numb	er)							
New England	1 -	18							
Middle Atlantic	2 1	13							
Chesapeake	5 4	54							
South Atlantic	4 4	65							
Gulf	3 3	103							
Pacific	1 2	117							
Great Lakes		9							
Alaska	1 4	35							
Hawaii		3							
Virgin Islands		1							
Total	17 18	418							
	Note: Vessels have been assigned to the various areas on the basis of registered								
home ports.									

the New England, Pacific, and Alaska areas with 1 each.



American Samoa

TUNA VESSELS REPORTED LANDING BIG CATCHES: The 1955 winter fishing season by the American Samoan tuna fleet, based at Pago Pago, appears to be very successful, according to the Pacific Islands Monthly, an Australian monthly magazine. The tuna vessels have brought in large catches from the water east of Fiji, and also from areas around the Cook Islands. Some record catches were reported which may be due to the long periods of dry clear weather.



California

SARDINE CATCH INCREASED IN 1955/56 SEASON: Landings by California's fishing fleet totaled about 75,000 short tons during the season which closed February 1, 1956, according to preliminary reports received by the California Department of Fish and Game. The 1955/56 catch increased about 12 percent over the 67,000 tons landed in the 1954/55 season.

Both the 1955/56 and the 1954/55 catch totals could have been exceeded considerably had there not been wage and price disputes and some adverse market conditions.

In both fishing seasons the catch represented sardines migrating north from Mexican waters, with practically none caught north of Morro Bay. Virtually none were landed at Monterey, and the fish processed there were trucked north from southern California. The catch was good in the Santa Barbara and Port Hueneme areas early in the season and later spread south as far as Oceanside.



Cans--Shipments for Fishery Products, 1955



Total shipments of metal cans for fish and sea food during 1955 amounted to 110, 191 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 109, 202 short tons for 1954.

Since the packs of canned tuna, Maine sardines, and salmon in 1955 were lower than in 1954, the greater shipments of cans in 1955 were for stock purposes rather than meeting current packing needs.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor; 23,0 base boxes of steel equal one short ton of steel.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPART-MENT OF DEFENSE, JANUARY 1956: The Army Quartermaster Corps during January 1956 purchased for the use of the U. S. Army, Navy, Marine Corps, and Air Force a total of 1.1 million pounds (valued at \$0.7 million) of fresh and frozen

	y P roducts						
of Defense (January 1956 and							
January 1955)							
QUANTITY VALUE							
Jan	uary	Jam	lary				
1956	1955	1956	1955				
(Millions of Lbs.) (Millions of \$)							

Furchases of Fresh and Frozen
Fishery Products by Department
of Defense (January 1956 and
January 1955)
fishery products. This was a decline of 39.2
percent in quantity and 16.9 percent in value as
compared to December 1955 purchases. Compared with January 1955, the drop was 47.8 percent in quantity and 13.3 percent in value.

January January
1956 | 1955 | 1956 | 1955 |
(Millions of Lbs.) (Millions of \$)
1.1 | 2.1 | 0.7 | 0.9 |

January January Prices paid for these fishery products by the Department of Defense in January 1956 averaged 68.7 cents a pound as compared with 43.7 cents in December 1955 and 41.4 cents a pound in January 1955. This would indicate that

that January 1956 purchases consisted of higher-priced fishery products.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make some local purchases which are not included in the above figures.

* * * * *

VETERANS ADMINISTRATION 1956 REQUIREMENTS FOR CANNED FISH: Among the estimated requirements of the Veterans Administration for canned fruits, vegetables, and fish to be procured for 1956 are the following canned fish items:

Descriptions	Can Size	Dozen Cans
Salmon, red or sockeye	No. 1	30,000
Salmon, red or sockeye with sodium content restricted to not more than $60~\mathrm{mg}$, per $100~\mathrm{grams}$.	No. $\frac{1}{2}$	7,000
Tuna, chunk	No. 1	18,000
Tuna, chunk, with sodium content restricted to not more than 50 mg. per 100 grams	No. $\frac{1}{2}$	8,000

stamps.

Invitations for bids will be issued by the General Supplies Section, Procurement Division, Supply Service, Veterans Administration, Washington 25, D. C., at a later date.



Fish and Wildlife Motif on United States Postage Stamps

For the first time, United States postage stamps this year will be used to call attention to the country's important fish and wildlife resources, Secretary of the Interior Douglas McKay said February 29.

The United States is one of the few major countries in the world that has not given recognition to fish and wildlife as a motif of postage-stamp design, accord-



The stamp is 0,84 by 1,44 inches in dimension, arranged horizontally with a single outline frame. The color of the stamp has not been determined as yet.

ing to the Secretary. Although conservationists and interested stamp collectors started a movement in 1949 for a "wildlife on stamps" series, they met with no success. However, when the matter was brought directily to the attention of President Eisenhower last September he immediately recommended that such stamps be issued to create and maintain greater public interest in the country's natural resources.

As already announced by the Post Office Department, the subject matter for the three stamps will be the pronghorn antelope, king salmon, and wild turkey.

Selection of the designs and responsibility for their authenticity was delegated to the Fish and Wildlife Service by the Post Office Department. Robert W. Hines, chief illustrator of the Service and noted wildlife artist, made the drawings for the

The designs selected by the Service--representing a mammal, a bird, and a fish--have been chosen because they are three different species of typical American wildlife and because they offer outstanding examples of conservation work carried on by the Federal and State Governments.

All three of the stamps will be in the 3-cent denomination. Places and dates of first-day sale will be announced later by the Post Office Department.

The new stamps are expected to be tremendously popular not only with conservationists but with topical stamp collectors, Secretary McKay said.

The Postmaster General announced March 7 that the first of the three stamps being issued to emphasize the importance of Wildlife Conservation in America will be released at Fond du Lac, Wis., on May 5, 1956. This special 3-cent stamp will be first placed on sale on the occasion of the convention of the Wisconsin Federation of Stamp Clubs.



Groundfish Fillets--United States Production and Imports

United States Production and Imports of Groundfish Fillets, 1940-55						
Year					Production	
		(Million Pounds				
1955					1/110.0	129.0
1954					122.4	137.5
1953					112.3	89.7
1952		٠			132.6	107.4
1951		٠	0		148.8	87.6
1950					136.6	64.8
1949					140.1	47.3
1948		۰			137.8	54.0
1947					115.5	35.1
1946					126.7	49.3
1945					126.4	43.2
1944					108.8	24.5
1943					87.3	16.3
1942					105.4	16.7
1941					122.8	9.9
1940					91.4	9.7
1/ Estimated.						

The United States production of fresh and frozen groundfish (including ocean perch) fillets in 1955 was estimated at 110.0 million-pounds--10.1 percent less than in 1954 and 26.1 percent less than the record production of 148.8 million pounds in 1951. Included in the production data for 1954 and 1955 is the production of fillet blocks and slabs, the raw material used to manufacture fish sticks.

United States imports of fresh and frozen groundfish (including ocean perch) fillets and steaks has risen steadily from 9.7 million pounds in 1940 to a record peak of 137.5 million pounds in 1954, and a slight drop to 129.0 million pounds in 1955. Also included in the data for 1954 and 1955 are the imports of fillet blocks and slabs used by United States producers to manufacture fish sticks.



Gulf Exploratory Fishery Program

<u>DEEP-WATER TRAWLING FOR RED SHRIMP BY "OREGON" (Cruise 36):</u> A two-week red shrimp trawling trip (Cruise 36) off the coasts of Mississippi, Alabama, and western Florida was completed by the Service's exploratory fishing vessel Oregon on February 28.

In general, shrimp catches were considerably smaller than those made in this same area last fall. A total of 26 three- to five-hour drags caught 1,993 pounds of

heads-on red shrimp (Hymeno-penaeus robustus). In 17 of these drags, 1,800 pounds were caught. Nine of the drags resulted in bogging of the trawls or ripped netting. The 1,993 pounds of headson shrimp yielded 1,100 pounds of heads-off shrimp which ran 25-30 count.

Fishing operations were conducted in depths of 200-275 fathoms with the most productive drags made in 215 fathoms adjacent to 88° west longitude. Three consecutive drags in this area caught 575 pounds of red shrimp. Weather conditions at this point forced discontinuance of fishing operations for the balance of the cruise.



M/V Oregon trawling stations (x), Cruise 36.

A total of seven days of fishing time were lost due to adverse weather.

Whiting and hake were the predominant incidental noncommercial species in all of the catches. From 100 to 800 pounds of these two species were taken in each tow. The individual fish varied in weight from $\frac{1}{2}$ pound to 2 pounds.

The <u>Oregon</u> was scheduled to leave Pascagoula March 20 on a 4-week tunalong-lining trip (Cruise 37) in the north-central and southwestern Gulf of Mexico. In March and April 1955, while the <u>Oregon</u> was engaged in deep-water shrimp exploratory work, a marked decline in the catch rate of yellowfin tuna was noted by the commercial vessels that were experimenting with long lines in the northeastern Gulf. The primary objective of this cruise will be to obtain comparative catch information for the early spring season between these two areas,



Maine

SARDINE TECHNOLOGICAL RESEARCH PUSHED AT UNIVERSITY OF MAINE: The work on several projects of technological research on Maine sardines at the University of Maine (Orono, Me.) is progressing at a good pace, reports the Maine Sardine Industry in a February 10 news release. The purpose of the research is to help Maine sardine canners improve their products and processes.

The researchers are well along on at least a dozen projects covering such matters as salt and moisture determination, best methods of preparing mustard and tomato sauces, efficient cooking times and temperatures, vacuum-packing, types of pack, temperatures in connection with cans of different sizes and thicknesses, flavor and texture, advantages of various types of oil and sauce, as well as other factors involved in the production of sardines.

Most of the work is being done in a recent additon to Holmes Hall, headquarters of the Experiment Station, and it is being financed by the Maine Sardine Council with funds derived from a 25-cents-a-case Maine State tax paid by all packers.

While visiting the laboratories, Council Chairman Ralph Stevens of Yarmouth stated that the research was needed by the industry to help it to compete with the thousands of other items being made available to the consumer in the nation's retail food stores. He predicted that the program would provide canners with information and improved techniques "that will be extremely valuable to all of us in the long run."

A staff, headed by the industry's Assistant Research Director Ralph Berglund, is utilizing standard factory equipment, such as retorts and sealing machines, with frozen fish, taken from Casco Bay last summer, as they attempt to unravel a variety of problems assigned to them. The packing operation is only one phase of the over-all program which has been functioning since last spring on a cooperative basis with Dr. Matthew Highland's Department of Food Processing of the Agriculture Experiment Station.



Marketing Prospects for Edible Fishery Products, January-June 1956

United States civilian per capita consumption of fishery products during the next 3 to 4 months is expected to be a little below that of a year earlier. January 1 stocks, which are the principal source of supplies until commercial landings start increasing seasonally, were much smaller than on the same date in 1955.

Imports in the next several months probably will be substantially the same as during the comparable period of 1955. Retail prices of fishery products until midspring are expected to average about the same or a little higher than a year earlier, reflecting in part the smaller supplies.

During 1955 civilians consumed a little less fish and shellfish per person than in 1954. The consumption rate for the fresh and frozen products were up a little, but this increase was more than offset by the decline for the canned commodities. Retail prices of fishery products in 1955 averaged slightly lower than in the preceding year, judging from the Bureau of Labor Statistics wholesale price index.

The United States and Alaska commercial catch of edible fish and shellfish in 1955 was about 2 percent smaller than in 1954. The sharp decline in the catch of fish used for canning much more than offset the small increase in the total quantity marketed fresh or frozen. Because of reduced catch, the packs of canned salmon, Maine sardines, and tuna were each smaller than in 1954. The 1955 pack of canned salmon was the smallest since before World War I.

Commercial freezings of fish and shellfish in the United States and Alaska during 1955 totaled 315 million pounds, 4 percent more than a year earlier. Domestic cold-storage holdings of the frozen products at the end of 1955 amounted to 175 million pounds, 10 percent smaller than at the close of the previous year. The reduction in stocks reflects both heavier marketings and a lower level of imports of frozen groundfish blocks and fillets than in 1954.

United States imports of fresh and frozen fishery products--excluding frozen tuna, which for the most part are subsequently canned--were more than in 1954. The moderate reduction in receipts of frozen groundfish fillets and blocks was more than offset by increases for fresh and other frozen fish. Our exports of fishery products were much larger in 1955 than a year earlier. Most of the increase occurred because of heavy shipments of canned California sardines abroad, particularly to the Philippine Republic.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's February 21, 1956, release of <u>The National Food Situation</u> (NFS-75).



OYSTER PARASITE DISTRIBUTION STUDIED: The fungus parasite Dermocystidium marinum, which often invades oysters, is believed responsible for the oyster losses in certain areas of Maryland. It was discovered about six years ago by biologists studying the causes of oyster deaths in the Gulf of Mexico, the February 1956 Maryland Tidewater News of the Maryland Department of Research and Education reports. During the past several years its presence and association with the loss of oysters in the lower Chesapeake Bay has been established by the Virginia Fisheries Laboratory. The parasites are very tiny single cells about two tenhousandths of an inch in diameter. As spores they are taken in by the oyster with its food and penetrate the walls of the digestive tract. They then multiply rapidly and are carried by the circulatory system to all parts of the oyster. Once within the oyster the parasite absorbs nourishment from the body fluids of the oyster and gradually dissolves the oyster tissues. In heavy infections they may cause large abscesses and ultimately the death of the oyster. Young oysters are resistant to the fungus and old oysters are most susceptible. Light infections may cause slow

growth and poor condition but do not kill oysters. However, as infection progresses to moderate and heavy, damage to the host becomes so great that it "gapes" and

dies. Recent discovery of the parasite does not, of course, mean that it is new to the area in which it has been found. It is probable, in fact, that it has been present in oysters for many years.

Although damaging to oysters, the yeastlike fungus is harmless to man and does not affect the flavor or nutritional value of oysters. The development in Texas during 1952 of a simple culture technique for the diagnosis of Dermocystidium infections has made possible large-scale surveys of its incidence in oysters. Small pieces of tissue are snipped

from oysters and placed in tubes containing a nutrient medium. After several days of incubation at room temperature the tissue is removed from the tube and placed on a glass slide for microscopic examination. If fungus cells are present they will have enlarged to ten or more times their original size and can be stained blue with iodine which makes them easy to recognize. Since the parasites do not reproduce in culture, it is also possible to estimate the intensity of the infection by the number of stained cells present.

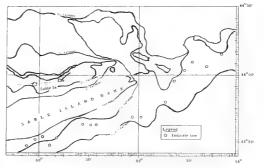
A survey is being made by the Chesapeake Biological Laboratory of the distribution of the fungus parasite among oysters in Maryland. Sample oysters have been collected from representative bars throughout the State and tested to determine whether, and to what degree they are infected with this fungus. High temperature and high salinity favor the development of the organism. Thus <code>Dermocystidium</code> infections typically show up in late summer in areas where the salinity is more than half that of sea water. Since a good portion of Maryland's oyster bars are in water less salty than this, they are relatively free from this disease. The pest has been found to be present in varying degrees of intensity on both sides of the Bay, roughly from the mouth of the Patuxent River southward. The study conducted in the fall of 1955 will be continued in order to evaluate the degree of infection where found, to determine the extent of infected areas in Maryland, and to establish the relationship of <code>Dermocystidium</code> infections to oyster mortalities and other factors influencing oyster populations.



North Atlantic Fisheries Exploration and Gear Research

OCEAN PERCH EXPLORA-TORY FISHING OFF SABLE IS-LAND BY "DELAWARE" (Cruise 15): A "closer look" at the area east of Sable Island, Nova Scotia, where excellent catches of ocean perch (Sebastes marinus) were made on a previous trip (Cruise 9) was the primary purpose of Cruise 15 of the Service's exploratory fishing vessel Delaware. A combination of bad weather and uneven bottom resulted in only 16 drags being completed during this cruise, which was completed on February 17.

The best single catch was on February 10, at latitude 43°39'N.



M/V Delaware's Cruise No. 15 (Feb. 6-18, 1956).

longitude 59°16' W., when 7,000 pounds of ocean perch were taken in a 1-hourdrag at an average depth of 200 fathoms. Average weight of the fish was 1.2 pounds.

Gear damage, from small tears to the loss of all four wings, occurred on 10 of the $16\ \mathrm{drags}$.

Part of the catch was iced in antibiotic ice for examination ashore.

The study of the seasonal availability of deep-water lobsters was scheduled to be continued during Cruise 16, with a repetition of exploratory tows made in productive areas on previous cruises. In addition, it was planned to expand the scope of deep-water lobster exploration to as far west as Hudson Canyon. A lobster fishery already exists there, but in relatively shallow water.



Pacific Oceanic Fishery Investigations

SONIC FISH FINDER USED BY "CHARLES H. GILBERT" TO LOCATE TUNA: Cruise 25: Search for tuna schools with a recently-installed radarlike long-range sonic fish finder was the primary objective of Cruise 25 of the Charles H. Gilbert, a research vessel of the Service's Pacific Oceanic Fishery Investigations. The ves-

sel left Pearl Harbor on January 16 and returned to that port on February 13, 1956.

Oahu 30 20° 20° N. Hawaii 100 Palmyra Island Fanning Island Christmas Island 1 00 A Jarvis Island 6 Legend: Yellowfin Catch Long-line. - Troll 100 100 160

Charles H. Gilbert cruise 25, January 16 to February 13, 1956.

A complete sea test of the "Sea Scanar" was curtailed by a mechanical breakdown in the instrument on January 21. Prior to the breakdown, a number of small skipjack tuna schools were recorded on the instrument just north of Palmyra Island. These fish schools were all observed within 1, 200 feet of the vessel (range of instrument 2, 400 feet) and were accompanied by bird flocks.

A total of 10 long-line stations was occupied in the equatorial zone. At each station 40 baskets of 13-hook cotton gear was fished. Only 23 yellowfin tuna were caught on the long-line gear with the highest catch of 6 yellowfin made just south of Jarvis Island. As evidenced by the catches, there was a conspicuous lack of yellowfin in the area covered. Other fish taken on the

long-line gear were 1 big-eyed, 5 skipjack, 38 sharks, 3 black marlin, 3 wahoo, 1 barracuda, and 3 lancetfish.

The only intensive trolling was conducted in the vicinity of Jarvis Island. Six lines were fished for a period of $5\frac{1}{2}$ hours. The catch consisted of 42 yellowfin, 6 wahoo, 34 jacks, 2 rainbow runners, 1 snapper, and 2 sharks. Almost all the fish were caught alongside the reef which extends only a short distance from shore.

The recording thermograph was on continuously throughout the cruise. Two small temperature "fronts" (changes of 1 to $1\frac{1}{2}$ degrees) were crossed at $1^{\circ}02^{\circ}$ N., $160^{\circ}10^{\circ}$ W. and $3^{\circ}08^{\circ}$ N., $165^{\circ}21^{\circ}$ W.

The vertical temperature distribution (from bathythermograph) showed a deep thermocline at about 600 feet in the equatorial belt. The isothermal and near isothermal water which extended often to this thermocline depth gave evidence of considerable mixing of the surface waters. It should be mentioned that strong easterly winds (exceeding 15 knots) were encountered through the two weeks spent south of 5 N. latitude.

Eight of the long line-caught and 25 of the troll-caught yellowfin were tagged with the California-type plastic tags.

<u>Cruise 26</u>: The vessel left Pearl Harbor February 23 for Cruise 26 and returned February 27. The stabilization tests showed that the starboard head was defective. Thus, only the port transducer was used during the remainder of cruise 26.

The "Sea Scanar" was tested on a school of skipjack tuna (average size 20 pounds) located 14 miles off Maile, Oahu. Fish traces were obtained only on the 600-foot scale with negative results on the 2,400-foot scale. Several strong unidentified echoes were obtained while running along the gear of a local long-line vessel.

Triplane tests showed that the tilt angle of the transducer did not coincide with that shown on the indicator panel.

A total of 95 skipjack were tagged with the California-type plastic tags and released on cruise 26.

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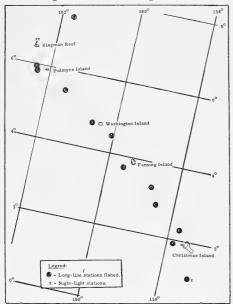
YELLOWFIN TUNA ABUNDANCE STUDIES IN LINE ISLANDS CONTINUED BY "JOHN R. MANNING" (Cruise 29): In order to obtain information on the abundance of yellowfin tuna in the Line Islands area, the Service's Pacific Oceanic Fishery Investigations vessel John R. Manning completed an experimental fishing trip on February 15. The vessel, which started the trip from Pearl Harbor on January 5, 1956, fished with conventional troll and long-line gear.

In general tuna appeared to be scarce around Christmas Island and in the southern part of the area, but some excellent catches were made with long lines at Palmyra Islands, where the best day's catch of 83 yellowfin gave a catch rate of nearly 14 fish per 100 hooks--about 5 times the average in Hawaiian waters. Longlining results at Washington Island were also good. The best trolling was found around Kingman Reef and Washington Island.

The John R. Manning collected environmental data from the waters north and west of Oahu from January 5 to 7. Made BT observations from 10 N. to the equator along 157 30 W. longitude from January 7 to 14. Fished 12 long-line stations and trolled for 12 days from January 15 to February 10 in the vicinity of the Line Islands.

A total of 23 days of scouting for fish schools and bird flocks, done concurrently with fishing operations or during daylight runs between stations, resulted in sightings of 52 tuna schools, 44 of which were accompanied by bird flocks, and 45 additional bird flocks. The area of greatest abundance was around Kingman Reef where 21 tuna schools and 10 bird flocks not associated with fish were sighted. At

all the other islands tuna schools and bird flocks were rather few in number. While a few large schools were sighted, most of them were in the small to medium cate-



John R, Manning, Cruise 29, January 5- February 15, 1956.

gories, and the sizes of the fish were estimated as being between 5 to 30 pounds each.

Trolling for 12 days from sunrise to sunset produced 108 yellowfin tuna, 6 skipjack, 260 wahoo, 13 rainbow runner, and 1 barracuda. The yellowfin catch totaled slightly over 1 ton. The best day's catch (30 yellowfin) was made at Washington Island and the next best catch (20 yellowfin) was made at Kingman Reef on two consecutive days.

Fishing for 12 days with 60 baskets of long-line gear set each day except the first, when only 56 were set, produced 169 yellowfin, 9 big-eyed, 7 skip-jack, 9 marlin, 9 other fish, and 221 sharks. The yellowfin catch totaled about $9\frac{3}{4}$ tons. The best day's catch (83 yellowfin or 13.6 yellowfin per 100 hooks) was made off Palmyra Island. Another station in the same locality 9 days later yielded 37 yellowfin. The next best catch (23 yellowfin) was made off Washington Island. The rest of the stations averaged 3 yellowfin each.

A total of 105 live yellowfin (46 from long-lining and 59 from trolling) was tagged and released in good condi-

tion. In addition, 4 skipjack and 1 big-eyed were tagged and released.

Bathythermograms were taken at 30-mile intervals along $156^{\rm O}30^{\rm I}$ W. longitude between $10^{\rm O}$ N. latitude and the equator. In addition, 4 bathythermograms were taken on the runs between the Line Islands and Honolulu and between Honolulu and the first BT position along $156^{\rm O}30^{\rm I}$ W. longitude.

Twenty bathythermograms, twenty surface salinity samples, and six 70-meter oblique plankton hauls were made in the waters north and west of Oahu.

Four night-light stations were conducted, two of which were inside Kingman Reef. On the second of the latter two stations, 5 tunalike juvenile fish were captured. Definite identification must await closer examination.

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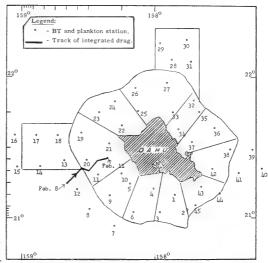
OCEANOGRAPHIC DATA COLLECTED BY "HUGH M. SMITH" (Cruise 32): The primary purpose of this cruise of the Pacific Oceanic Fishery Investigations vessel Hugh M. Smith was the collection of oceanographic data. The cruise period was February 1-11.

A total of 45 stations were occupied. Plankton collections at 0-60 M., 70-130 M., and 140-200 M. were made at each station using three 1-meter closing nets. At the first station after 2,000 hours each night, two additional collections were

made: (1) A 200-M. double oblique haul with the 10' Isaacs-Kidd mid-water trawl and (2) a 200-M. double oblique haul with a 1-meter open net. At each station surface water samples were taken for salinity determinations; a BT cast was also made at each station.

At each station water samples were taken to check the reliability of the PO_4 analysis of frozen sea water samples. These samples were in addition to the samples used in the shipboard determination of PO_4 .

The current-drag gear test was carried out satisfactorily with only minor changes needed in the gear. Five expendable drags were released and 3 of these were retrieved. See chart for course of the main drag. A satisfactory routine was developed for the plankton and trawl work to be done during cruise 33.



Station Pattern of Hugh M. Smith's Cruise 32, February 1-11, 1956.



Saltonstall-Kennedy Act Fisheries Projects

AMERICAN FISHERIES ADVISORY COMMITTEE TO MEET IN CALIFORNIA: The third meeting of the American Fisheries Advisory Committee, authorized under the Saltonstall-Kennedy Act of 1954 will be held on May 1 and 2 in Long Beach, Calif., according to an announcement dated February 21 by Assistant Secretary of the Interior Wesley A. D'Ewart who will serve as presiding officer during the meeting.



The chief objective of the meeting will be to review the status of current fishery research and development projects being financed by Saltonstall-Kennedy funds and to discuss recommendations for next year's program. The program is now in the second year of operation.

The Saltonstall-Kennedy Act, approved on July 1, 1954, provides \$3 million annually, for three years, from duties on imported fishery products for the purpose of aiding the American commercial fishing industry by promoting the free flow of domestically-produced fishery products in commerce and developing and increasing markets for these products. The Act authorizes the use of these funds to provide an educational service and market development program, and to conduct research in the fields of technology, biology, and related activities.

Under a provision of the Act, the Secretary of the Interior was authorized to appoint a group of experts from the different segments of the industry-fishermen, vessel owners, distributors, and processors of fish and fishery products and by-products--to advise him on commercial fishing problems. The committee consists of 19 members, appointed to serve until June 30, 1957.

Two meetings were held in 1955, the first in Washington, D. C., in April, and the second in Boston in August. A different city is selected for each meeting in order to give committee members the opportunity to study at first hand new developments in important fishery areas of the country. While in the Long Beach-San Pedro area, the group will inspect local fishery activities.

* * * * *

FISHERY STATISTICAL OFFICE OPENED IN ANNAPOLIS: A statistical office for the collection of fishery data has been opened at Annapolis, Md., by the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service. The office will collect detailed data on employment in the fisheries, number of craft and quantity of gear operated, catch of fishery products, and related information on the fisheries of Maryland. Establishment of this office will permit earlier release of data on the important fisheries of the Chesapeake Bay States.

Lloyd Johnson, formerly of the Fort Myers (Fla.) Statistical Office, will be in charge of the Annapolis Office.

This new office is being financed by funds provided by the Saltonstall-Kennedy Act of 1954 (68th Stat. 376).



Shrimp's Chief Retail Outlets are Frozen-Food Cabinets

The grocer's frozen-food display cabinet is the chief salesman for the shrimp industry based on dollar value, according to a recent survey. The survey, the first of its kind auditing shrimp retail sales and inventories on a national basis, was made by the U. S Fish and Wildlife Service through a contract with the A.C. Nielsen Company during August and September 1955. Sales of packaged shrimp products from frozen-food display cabinets, including such specialties as shrimp cocktail, creole, sticks, and deviled shrimp, were estimated to average over \$5.6 million a month during the study period as compared with about \$5.2 million for fresh and bulk-frozen shrimp sold over the fish counter and \$1.4 million for canned shrimp.

Only about one-third of all grocery stores in the United States carry shrimp and shrimp products in their frozen-food display cabinets, although these stores do a large part of the nation's total retail food business. Retail distribution of frozen packaged shrimp products is confined mainly to large-volume stores. Fish-counter sales of fresh and bulk-frozen shrimp are confined to such stores even more so. At the time of the survey audit, even among stores normally carrying packaged frozen shrimp products, 25 percent were out of stock of breaded cooked shrimp, 12 percent of breaded uncooked shrimp, and 13 percent of 'green' or fresh shrimp.

The survey is part of a comprehensive study the Service will make of the shrimp industry, including an examination of the potential market for shrimp products, the efficiency of processing plants in primary marketing, work practices on shrimp fishing vessels, cost of vessel operations, and other matters pertaining to the production, preparation, and distribution of shrimp and shrimp products. The project is financed by funds provided by the Saltonstall-Kennedy Act of 1954 to help the free flow of domestic fishery products into channels of trade.



South Atlantic Exploratory Fishery Program

CHARTERED VESSEL TO EXPLORE SOUTH ATLANTIC FOR SHRIMP: A new deep-water fishery exploration program in the Atlantic Ocean off the Carolinas, Georgia, and Florida, was initiated by the U. S. Fish and Wildlife Service, Assistant Secretary of the Interior Wesley A. D'Ewart announced February 28, Empha-

sis will be placed on shrimp exploration, primarily to see if there is a commercial supply of shrimp in deep water, but the work may provide valuable data on other species of fish.

The project will be carried out with the Service's recently-chartered vessel, the <u>Pelican</u>, which is scheduled to leave Jacksonville, Fla., February 29. The <u>Pelican</u>, steel-hulled and 73 feet long, has been used regularly for commercial shrimp fishing, and the vessel's operation is under the immediate direction of Donald Bates. The vessel, which will have a crew of four commercial fishermen, has been specially



The Pelican, a vessel recently chartered by the U. S. Fish and Wildlife Service for deep-water fishery explorations in the Atlantic Ocean off the coast of southeastern United States,

rigged for deep-water trawling with the installation of a winch holding 800 fathoms of wire rope.

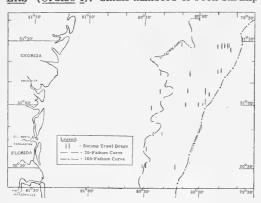
The <u>Pelican</u> is assigned to explore the Atlantic from Cape Hatteras, N. C., to Cape Canaveral, Fla. The exploratory work will be done in offshore waters ranging from 20 to 300 fathoms in depth. In some instances the <u>Pelican</u> will be as much as 90 miles offshore during the progress of the explorations.

The project is financed by funds provided by the Saltonstall-Kennedy Act of 1954 and is one of the activities recommended by the American Fisheries Advisory Committee named by Secretary Douglas McKay.

Shrimp fishing has been an important industry in the waters off the South Atlantic States for a number of years, but most of the fishing has been done in the comparatively shallow waters close to shore. Because of the fluctuations in the shrimp take in that area, many believe that the shrimp move periodically into the deeper water some distance from the land.

* * * * *

FIRST SHRIMP EXPLORATION TRIP COMPLETED BY "GEORGE M. BOW-ERS" (Cruise 1): Small numbers of rock shrimp (Sicyonia brevirostris) were taken



M/V George M. Bowers, Cruise 1, January 1956

over a wide offshore area between Jacksonville, Fla., and Savannah, Ga., during the first cruise of the U. S. Fish and Wildlife Service's exploratory vessel George M. Bowers, completed January 31, 1956. This was the first of a series of exploratory operations to determine species of shrimp present and the commercial fishing potential of the South Atlantic area.

The George M. Bowers used a 40-foot flat shrimp trawl to make 25 one-hour drags in the area between the 20- and the 50-fathom depth contours. The rock shrimp (21-25 count), a species with a hard lobster-like shell and not presently in commercial de-

mand, were caught in 17 drags. The catch ranged from individual shrimp to $2\frac{1}{2}$ pounds (heads-on) per drag. Nine <u>Trachypeneus</u> sp., a member of the commercial shrimp family, were taken in 4 drags. None of the presently commercially-valuable species (white, pink, or brown shrimp) were taken.

Bottom conditions as observed by echo tracings and bottom samples indicated extensive trawlable sandy bottom between 20-30 fathoms. Between 30-50 fathoms the area was found to be generally rocky, rough, and to drop off steeply.

Several commercial species of flat fish were taken in 22 hauls. The principal species taken in these hauls were northern fluke (Paralichthys dentatus), ocellated fluke (Ancylopsetta quadracellata), and small-tailed flounder (Syacium micrurum?). The average weight of these fishes was approximately one pound.

During the regular trawling operations 8 tows were made with a cod-end cover attached to the trawl for escapement studies by a University of Miami Marine Laboratory cooperator aboard. No commercial species of shrimp were taken in these drags and the operation was discontinued.



Sport Fishing License Sales Set New Records

Sport fishing and wild-game hunting in the United States attracted enough new recruits during the fiscal year ended June 30, 1955, to establish a record of 33,046,361 paid license holders, an increase of 392,162 over the previous year, the Fish and Wildlife Service reported March 4 to Secretary of the Interior Douglas McKay.

In the enjoyment of these outdoor sports, hunters and fishermen spent nearly \$87 million for all types of hunting and fishing licenses, permits, tags, trout stamps, and Federal duck stamps.

Fishing, still the most popular sport, recorded 18,854,809 paid license holders, compared with 18,580,813 in fiscal year 1954.

In 1955, fishermen paid \$39,501,838 for all types of licenses and special permits, tags, and trout stamps. This is an increase of \$574,103 over the 1954 total of \$38,927,735.

	Paid F	ishing License Ho	lders	Total Licenses,	Total Cost2 to
State	Resident	Non-Resident	Total	Permits, Etc. Issued	Anglers for All Licenses Issue
Alabama	221,515	20,515	21,2,030	250,896	\$ 288, 344
Arisona	94,874	48,054	142,928	142,928	379,294
Arkansas	264, 1.15	133,978	398,393	398,393	752,514
alifornia	1,271,038	16,942	1,285,980	1,285,980	3,847,275
Colorado	258,094	102,609	360,703	360,724	891,804
Connecticut	104,321	4,360	108,681	109,425	378,511
Delaware	9,756	1,636	11,392	11,392	24,465
Torida	268,1,13	102,683	370,896	370,896	969,656
leorgia	423,51.1	7,270	430,811	1,37,876	282,498
[daho	183,319	65,929	249,248	254,508	706,089
Clinois	862,908	19,087	881,995	881,995	1,020,878
[ndiane	584,275	39,44,2	623,717	£42,923	705,062
Iowa	399,310	15,389	414,699	1,14,699	595,002
(anses	213,267	5,766	219,033	219,033	LL8,071
(entucky	327,956	77,968	405,924	405,924	861,405
coisiana	187,832	29,450	217,292	217,282	282,876
set no	136,750	74,308	211,058	211,758	642,475
eryland	96,705	22,803	119,508	120,790	219,034
Sassachusetts	221,664	6,289	227,953	242,356	659,222
dichigan	878,668	309,466	1,188,134	1,404,908	2,300,928
finnesota	1,058,432	316,510	1,374,942	1,491,023	2,523,412
dississippi	131,784	34,397	166,181	166,181	379,1,05
desouri	51:0,984	51,761	592,725	592,725	1,341,066
Montana	178,244	38,207	216,451	216,651	482,972
Nebraska	222,219	10,559	232,778	232,778	366,1277
9ewada	20,303	25,494	54,887	60,382	192,137
few Hampshire	81,822	51,116	132,934	136,697	437,300
New Jersey	138,624	9,838	118,462	230,613	584,261
iew Mexico	63,369	32,020	95,380	97,412	346,099
Yew York	766,585	13,034	910,510	81,7,982	1,835,910
eorth Carolina	m6,508	10,516	327,05%	382,934	657,143
worth Dakota	76,360	1,916	75,276	78,276	82,108
Mio	830,103	47,813	877,916	877,016	1,727,877
klahoma	352,795	60,688	113,179	413.479	889,911
regon	291,115	27,092	318,207	31.9 , 34.2	1,169,232
Pennsy) vania	706,079	33,955	740,034	74,0,034	1,880,228
thode Island	19,950	518	20,468	26,297	47,477
South Carolina	311,361	12,002	324,163	375,870	11,900
South Dakots	100,199	38,963	139,142	130,142	277,065
Tennessee	522,797	219,299	712,096	811,706	766,146
exa a	455,975	8,359	44,334	446,336	782,53
)tah	1%,586		173,100	181,111	513,129
7ermont	75,207	34,335	109,562	109,644	253,487
firginis	359,474	12,113	371,587	442,679	597,056
eshington	351,756	19,980	371,736	371,736	1,342,280
est Virginia	185,278	1,862	193,140	219,907	377,129
fisconsin	758,381 113,766	326,337 56,616	1,085,718	1,112,213	2,342,476 587,28F
dyoning TOTALS	. 16,211,767	2,643,042	18,854,859	19,625,387	\$39,501,838



Is destroyed by some states.

Resident fishing licenses accounted from 16,211,767 of the 18,854,809 total; nonresident licenses numbered 2,643,042.

The states to attract the greatest number of nonresident anglers were Wisconsin

The states to attract the greatest number of nonresident anglers were Wisconsin, Minnesota, Michigan, Tennessee, Arkansas, Colorado, and Florida, in that order. In Nevada, license sales to nonresidents amounted to 25,494 of their total of 54,887.

This is the second year a new system of reporting hunting and fishing license statistics has been used. As developed by the Service last year, the general licenses are segregated from the special licenses, permits, tags, stamps, etc. This eliminates duplications in the totals since a hunter may buy, in addition to his general license, a pheasant license-tag and a deer permit, or a fisherman may be required in some states to purchase a trout stamp.

The apportionment of Federal aid funds to the states for fish and wildlife restoration programs is based upon the number of paid license holders and not upon the total of all licenses and permits issued. For apportionment purposes in fiscal year 1957, the total in 1955 of 18,854,809 paid fishing license holders will be used in apportioning funds for fish restoration under the Dingell-Johnson program.

In the table, the data have been arranged in five columns. The first three columns cover, as nearly as can be determined, the number of paid license holders, consisting of resident, nonresistant, and the total for each state. The fourth column presents an enumeration of all types of licenses issued by the states to sportsmen, such as general fishing licenses, and special types of issuances such as trout stamps, special area licenses, free licenses to the aged, veterans, etc., special gear permits (fish houses, etc.), and others. The numbers of these special licenses is indicative of the growing trend toward more highly specialized and regulated fishing. The fifth column gives the gross cost which sportsmen pay for the

right to indulge in their favorite sports. The totals in the fifth column include fees for the general licenses, and for all special permits, tags, and stamps.

Note: See Commercial Fisheries Review, April 1955, p. 47.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, DECEMBER 1955: United States imports of fresh, frozen, and processed edible fish and shellfish in December 1955 amounted

United State Products						
		Quanti	ty	Value		
Item	Dec.		Year	Dec.		Year
	1955	1954	1954	1 955	1954	1954
Imports: Fish & shellfish: Fresh, frozen, & processed 1/	. (Mil	lions of	Lbs.).	(M	illions o	(\$) 202.8
Exports: Fish & shellfish: processed 1/ only (excluding fresh and froz- en)	9,9	6,2	50.8	2,0	1.3	13,2

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

to 56.4 million pounds (valued at \$17.2 million), according to a U. S. Department of Commerce summary (see table). This was a decrease of about 21 percent in quantity as compared with November 1955, but an increase of 14 percent over the imports for December 1954. The value of the December 1955 edible fishery products imports was 16 percent lower than November 1955, but 22 percent higher than December 1954. The dollar value in December 1955 works out to about 30.5 cents a pound as compared with 28.5 cents a pound in December 1954. Shrimp imports in December 1955 continued at a relatively high level.

Exports of processed edible fish and shellfish in December 1955 were down in quantity about 31 percent as compared with November 1955, but

were almost 60 percent higher than in December 1954. The value of these exports in December 1955 were 39 percent below November 1955, but 54 percent higher than the same month a year earlier.

* * * * *

GROUNDFISH FILLET IMPORTS IN JANUARY 1956 ABOVE A YEAR AGO: Imports of groundfish (including ocean perch) fillets during January 1956 amounted to

15.5 million pounds. Compared with the imports for the same month of last year, this was an increase of 18 percent (see Chart 7 in this issue).

The increase was primarily due to considerably larger imports from Canada and Iceland, although less spectacular increases were noted from almost all of the other exporting countries as well. Canada and Iceland accounted for 91 percent of the total January imports.

Other countries exporting groundfish fillets to the United States



during the first month of the current year were Norway, Denmark, the Netherlands, West Germany, and Greenland.

The quota of groundfish (including ocean perch) fillets permitted to enter the United States at 17 cents per pound in the calendar year 1956 is 35,196,575 pounds compared with 35,432,624 pounds in 1955. Imports in excess of the quota enter at a duty of $2\frac{1}{2}$ cents a pound. Included in this category are imports of fillet blocks and slabs of these species.



Wholesale Prices, February 1956

The improvement in the production of groundfish and some flatfish varieties on the East Coast was reflected in the lower February 1956 index (113.7 percent of the

Table 1 - Wholesale Average Prices and Indexe	s for Edible F	ish an	d Shell	fish, Febr	uary 1 950	6 With C	Compari	sons
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. 1	Prices1/	Indexes (1947-49=100)			
			Feb. 1956	Jan. 1955	Feb. 1956	Jan. 1955	Dec. 1955	Feb. 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)		١			113.7	122.3	112,6	101.8
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh		іь.	.09		121.5 114.1 86.9	136,5 143,5 208,2	121,1 117,0 124,3	103.0
Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, lge. & med., drsd., fresh or froz.	New York New York	lb. lb. lb.	.32 .60	.29	97.5 134.3 181.0	89.2 135.4 170.1	85.1 133.1 131.4	79.4 119.7
Whitefish, L. Superior, drawn, fresh Whitefish, L. Erie pound or gill net, rnd., fresh Lake trour, domestic, No. I, drawn, fresh Yellow pike, L. Michigan & Huron, rnd., fresh	Chicago New York Chicago New York	ib. ib. ib.	.74	.70 .64	131,4 150,6 129,0	141.5 131.1 117.3	136.5 132.2 102.0	96.0 133.2 123.2
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb, tins Shrimp, Ige. (26-30 count), headless, fresh Oysters, shucked, standards	Boston	lb. lb. gal.	.32 .77 5.62	.75	127.6 110.6 121.7 139.2	133.7 217.7 118.5 136.1	124.1 132.7 113.4 136.1	104. 100. 91. 120.
Processed, Frozen (Fish & Shellfish):					116.5	117.6	114.2	97.
Fillets: Flounder, skinless, 1-lb. pg. Haddock, sml,,skins on, 1-lb. pkg. Ocean perch, skins on. 1-lb. pkg. Shrimp, Ige. (26-30 count), 5-lb. pkg.	Boston Boston Boston Chicago	lb. lb. lb. lb.	.39 .30 .29	.30 .29	102.1 92.6 114.8 119.6	104.7 92.6 114.8 121.1	104.7 91.0 112.8 116.5	104.7 89.4 111.8 86.8
Canned Fishery Products:	<u> </u>				102,4	102,2	100.5	100.0
Salmon, pink, No.1 tall (16 oz.), 48 can/cs Tuna, It, meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs Sardines, Calif., tom, pack, No. 1 oval (15 oz.),	Seattle Los Angeles		21.70 11.80		120,0 85,1	120.0 85.1	114.8 85.1	93.0
48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	Los Angeles New York	case		7.00 8.45	83,2 89,9	81.7 89.9	81.7 92.6	85.5 76.6
(0-1/±0Z,), 100 Calls/Cs	INEM TOLK	case	0.45	0,40	05,5	09.9	92,0	L,

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs, These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned). The improvement in the supply of groundfish, particularly haddock, was principally responsible for the decline of 7 percent from January to February, but the index for February 1956 was still 11.7 percent higher than for the same month in 1955.

The decrease of 20.5 percent from January to February in the drawn, dressed, or whole finfish subgroup index was due entirely to the sharp drop in ex-vessel

prices at Boston (drawn offshore haddock was down 58.3 percent). All other items included in this subgroup were either unchanged or from 5 to 15 percent higher. Compared with February 1955, the drawn, dressed, or whole finfish subgroup index this February was higher by 13.6 percent due to higher prices for all items, but the



At the Boston Fish Pier, after fish is unloaded from the hold of the fishing vessel and packed in boxes, it is hauled to the processor for filleting.

sharpest increase occurred infrozen dressed halibut prices which rose 22.8 percent because of the lighter supplies of frozen halibut available in 1956.

The fresh processed fish and shellfish subgroup index declined 4.6 percent from January to February, but was 22.3 percent higher than in February 1955. The drop from January 1956 to February 1956 was due primarily to lower prices for haddock fillets at Boston as prices for both fresh shrimp and oysters were upslightly. Stronger markets for fresh haddock fillets, shrimp, and oysters accounted for the higher prices this February as compared with a year earlier.

The processed frozen fish and shellfish February subgroup index changed only slightly from that of the previous month, but was up almost 20 percent above the same month in 1955. The increase between February 1956 and February 1955 was for all items in the subgroup except frozen flounder fillet prices which dropped about 2 percent. Frozen shrimp prices at Chicago this February were 37.8 percent above those for the same month a year earlier.

The canned fishery products subgroup index for February was about unchanged for January 1956, but was up 2.4 percent over February 1955. Production of canned fish during February 1956 was principally limited to tuna. Compared with February 1955, this February's substantially higher prices for the limited supplies of canned salmon and Maine sardines were offset almost entirely by the lower prices for the ample supplies of canned tuna and California sardines.





International

TERRITORIAL WATERS

UNITED STATES RESERVATION ON INTER-AMERICAN JURIST COUNCIL RESOLUTION ON TERRITORIAL WATERS: The Inter-American Council of Jurists concluded a meeting in Mexico City on February 5, and in the concluding session of that meeting a resolution on territorial waters was passed. The Council is made up of specialists in international law from each of the American Republics. The United States and other delegations raised basic questions regarding the contents of the resolution, and the United States representative filed a strong reservation on behalf of the United States both as to the contents of the resolution and the method used to pass it. The text of the reservation filed by the United States Government follows:

DECLARATION AND RESERVATION OF THE UNITED STATES OF AMERICA ON THE RESOLUTION ON TERRITORIAL WATERS AND RELATED QUESTIONS, ORGANIZATION OF AMERICAN STATES, INTER-AMERICAN COUNCIL OF JURISTS, THIRD MEETING, MEXICO CITY, JANUARY-FEBRUARY 1956

For the reasons stated by the United States representatives during the sessions of committee I, the United States voted against and records its opposition to the Resolution on Territorial Waters and Related Questions. Among the reasons indicated were the following:

That the Inter-American Council of Jurists has not had the benefit of the necessary preparatory studies on the part of its permanent committee which it has consistently recognized as indispensable to the formulation of sound conclusions on the subject:

That at this meeting of the Council of Jurists, apart from a series of general statements by representatives of various countries, there has been virtually no study, analysis, or discussion of the substantive aspects of the resolution;

That the resolution contains pronouncements based on economic and scientific assumptions for which no support has been offered and which are debatable and which, in any event, cover matters within the competence of the specialized conference called for under resolution LXXXIV of the Tenth Inter-American Conference;

That much of the resolution is contrary to international law;

That the resolution is completely oblivious of the interests and rights of States other than the adjacent coastal States in the conservation and utilization of marine resources and of the recognized need for international cooperation for the effective accomplishment of that common objective; and

That the resolution is clearly designed to serve political purposes and therefore exceeds the competence of the Council of Jurists as a technicaljuridical body.

In addition, the United States delegation wishes to record the fact that when the resolution, in the drafting of which the United States had no part, was submitted to committee I, despite fundamental considerations raised by the United States and other delegations against the resolution, there was no discussion of those considerations at the one and only session of the committee held to debate the document.

Note: Also see Commercial Fisheries Review, March 1956, p. 28.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ANNUAL MEETING ANNOUNCED: The Annual Meeting of the International Commission for the Northwest Atlantic Fisheries will be convened at Commission head-quarters in Halifax, Nova Scotia, June 11-16, 1956. The first plenary session is scheduled to open on June 11. A symposium on cod is to be held on June 14.



Notifications of the Annual Meeting have been circulated to member countries from the Secretariat.

Regulations of the trawl fishery for haddock and cod in subareas 3, 4, and 5 proposed by the Commission at its 1955 Annual Meeting were forwarded to the Depositary Government (United States) for transmission to member countries. Up to date the Secretariat has been informed by the Depositary Government of the acceptance of these regulations by Norway and Portugal, a February 10 newsletter from the Commission reports.

* * * * *

UNITED STATES RESEARCH PROGRAM FOR 1956 IN COMMISSION AREA: Operations of the "Albatross III": This vessel will be operated throughout the year in the Convention Area, principally in Subarea 5 and especially in the region of Georges Bank. In the winter and spring, plankton and hydrographic surveys will be conducted to determine the fate of the 1956 spawning of haddock. During the summer, studies will be made of sea scallops (Placopecten magellanicus (Gmelin)) and of bottom fauna as related to the occurrence of bottom fish. In the fall, studies will be made of the distribution of the 1956-year class of haddock. As time permits, other cruises will be made for purposes of tagging and mesh selectivity studies. No cruises are planned beyond Subarea 5 except to Browns Bank, south of Nova Scotia (Subarea 4).

Operations of the "Delaware": During 1956, the <u>Delaware</u> will make seven cruises in Subarea 4 in deep-water exploration for ocean perch. These cruises will average about 12 days each. Seven cruises are planned in Subarea 5 exploring for commercial concentrations of fish or shellfish in deep water. One cruise in April will be made in Subarea 5 to conduct antibiotic ice experiments.

<u>Hydrographic Studies</u>: The Woods Hole Oceanographic Institution will be making special hydrographic studies south of Cape Cod (Subarea 5) and will test a number of automatic devices for recording temperature and currents. Observations will be taken routinely from lightships.

Other Studies: In addition to the field work described above, the usual sampling of the commercial catches and also the general analyses for population studies of haddock and ocean perch will be done. To this may be added silver hake, red hake, and sea scallop in Subarea 5. Gear selection studies and studies of conversion factors will be continued.



Australia

QUEENSLAND SHRIMP FISHERY: The years 1954 and 1955 saw substantial increases in prawn or shrimp production in Queensland's waters following the introduction of trawling methods. These trawlers maintain constant radio contact over approximately 1,200 miles of coastline, from Cairns to the southern border, for the latest fishing information.

Shrimp are delivered to and sold by the Queensland Fish Board. The ex-vessel price is determined at auctions on the basis of supply and demand. However, shrimp caught in Queensland waters are not all sold in that State but may be shipped to and sold in other Australian states.

High prices are presently being paid for shrimp in Sydney markets, according to a February 23 communication received by the U.S. Fish and Wildlife Service.

A news release from Sydney, dated February 14, points out that Australian Trade Authorities are looking to the Australian fishing industry to build up export markets, particularly in North America. Spiny lobster exports already are a big dollar earner, and recently there have been inquiries, for shrimp, which abound in rich fishing grounds off the Queensland and New South Wales coasts. The yield from these grounds in 1955 was 6 million pounds. The Australian Director of Fisheries believes that shrimp exports could earn up to US\$10 million a year. A spokesman for the fishing industry said that the Federal Government had been asked to set up a Fisheries Council to develop and stabilize the fishing industry in Australia.

The big increase in the Australian shrimp catch in the last 12 months has been due principally to the discovery of rich fishing grounds off Bundaberg, Queensland. In New South Wales, the shrimp catch in the last five years has increased by about 1 million pounds each year, and the 1954/55 fiscal year yield was more than 4 million pounds. Queensland's catch in the same period was 2 million pounds. Queensland and New South Wales are Australia's main shrimp-producing states.

Note: See Commercial Fisheries Review, February 1956, p. 44.

--Personal Communication from Stewart McCracken, El Monte, Calif. (2/23/56)



Ecuador

FIRST NATIONAL FISHING CONGRESS: Ecuador's first national fishing congress was held under the auspices of the National Fishing Institute (with the support of the Ecuadoran Government) at Quito, February 15-17, 1956. The agenda included: (1) Maritime policing of fishing vessels; (2) Fishing chart for ocean patrols; (3) Regulations of the activities of foreign vessels in Ecuadoran waters; (4) Regulations for bait fishing; (5) Necessity for new law on fishing and hunting; (6) A National Commission for fishing development; (7) The fishing industry and the State; (8) Regulations for radio communications between land bases and vessels; (9) Documentation of foreign seamen serving on fishing vessels in the service of national companies; (10) Oceanographic Institute.

The Central Bank was scheduled to participate in the Congress, according to a January 10 dispatch from the United States Embassy at Quito. The Bank is concerned with exports of fish and shellfish, the imports necessary for the fishing industry, and monetary regulations governing these exports and imports.



F'rance

At a meeting of the Sardine Industry Committee held at Nantes on November 3, 1955, it was unanimously decided to bar further importations of foreign and Moroccan sardines.

Guatemala

FISHING LICENSES: Decree 550, recently issued by Guatemala, authorizes the Ministry of Agriculture to grant licenses for a maximum period of ten years to fish in the country's rivers, lakes, or seas. This decree replaces a resolution of January 22, 1955, which authorized the granting of licenses (no mention made of time limit) without necessity of recourse to bidding, states a United States Embassy dispatch (February 23) from Guatemala City.



Iceland

SHRIMP AND LOBSTER FISHERIES: Iceland's 1955 production of frozen shrimp amounted to 20.1 metric tons and of lobster, 10.3 tons, reports a February 6 United States Embassy dispatch from Reykjavik. No other crustaceans are produced in Iceland.

The Fisheries Association estimates the annual canned shrimp production between 10 to 20 metric tons, the majority of which is consumed locally.

Exports of frozen shrimp and lobster during the year 1955 totaled 36.6 metric tons--30.9 tons to the United States and 5.7 tons to the United Kingdom. The export statistics combine shrimp and lobster and no breakdown of each is available.

The Icelandic shrimp is smaller in size and of a stronger taste than the shrimp caught off the United States east coast. The lobster caught off the Icelandic coast is of genus Ephrops norvegicus and lacks the chelae or pincerlike claws.



India

JOINT INDO-JAPANESE FISHING ENTERPRISE: An Indo-Japanese fishing enterprise (the New India Fisheries Limited) has been registered as a public limited company in Bombay to exploit the fishery resources in the deep sea waters off the Bombay and Saurashtra coasts. The company's stocks were being offered to the public in mid-February, a United States consular dispatch (February 17) from Bombay announces.

According to an announcement published by the promoters in the local press, the new company will have an authorized capital of 10 million rupees (US\$2,100,000) of which the initial issue will total Rs. 1,500,000 (US\$315,000). Of this amount, the Taiyo Fishery Company Limited of Japan, which will share its technical knowledge and experience with the new firm and also supply fishing trawlers and technicians, has been allocated 49 percent in consideration for the equipment and services it will provide. Of the remaining 51 percent, the Indian promoters of the firm and their friends have agreed to take up 2,056 shares of the total value of Rs. 205,600 (US\$43,176) and the balance of Rs. 559,400 (US\$117,474) made up of 1,443 preference shares and 4,151 ordinary shares of Rs. 100 (US\$21) each, are available for public subscription. The company will have 8 Indian and two Japanese directors.

A significant feature of the new flotation is the offer of certain financial guarantees by the Japanese firm. Besides guaranteeing the Indian shareholders a minimum dividend of 6 percent every year, the Japanese firm has agreed, in the event of liquidation of the company, to indemnify the Indian shareholders against any loss in capital.

The aims and objects of the company, as set out in the Memorandum and Articles of Association filed with the Registrar of Companies, Bombay, include the exploitation of the fishing grounds in the Arabian Sea off the Bombay and Saurashtra Coasts by means of modern technical fishing methods such as are used in Japan. The company will also engage in other related activities, such as the installation of refrigeration plants and erection of fish storages. As catches increase, ancillary industries such as shark-liver oil production and fish canning will be organized.

It is understood that the Japanese company will provide the new company with four bull trawlers and about 30 technicians from Japan. It is proposed to train local personnel for the positions of skippers, mates, boatswains, engineers, and radio operators in due course. The boats were expected to arrive in Bombay the last week of March and fishing operations were to commence in April 1956.

The present venture is the outcome of the successful trial fishing operations by an otter trawler belonging to the Japanese company in the Arabian Sea during the last two or three years. In 1952/53, this trawler caught 1,163 metric tons of fish in 22 voyages and in the following year it caught 987.5 tons in 21 voyages. Fishery experts believe that bull-trawling will be even more successful as is evidenced by the results of experimental operations of the Government of India's Pilot Deep Sea Fishing Station in Bombay. Two bull trawlers belonging to the Station caught on an average 130 percent more fish than the Japanese trawler while operating simultaneously in the same fishing grounds off Saurashtra during 1953/54. Considering that the Government of India's trawlers were each only one-half the size of the Japanese trawler and, moreover, were not ideally suited for bull-trawling as these were built for otter trawling, their performance is said to underscore the relative superiority of bull-trawling. This method of commercial fishing in the Arabian Sea is believed to offer considerable potentialities.

Note: Values converted to USS equivalents on the basis of 1 rupee equals US30,21.



Japan

<u>DESCRIPTION OF MOST ADVANCED TYPE TUNA VESSEL</u>: The <u>Kuroshio Maru No. 21</u>, now on her fifth trip to the Indian Ocean between Ceylon and Madagascar fishing for yellowfin tuna, is one of the most advanced types of tuna vessels in Japan, according to a January 24 report from the United States Embassy in Tokyo.

This vessel, built in 1954, is a refrigerated-cargo carrier-type of 1,858 gross tons (1,383 deadweight tons), powered by a 2,100 hp. Diesel engine, and a speed of 13 knots. The vessel's equipment includes radar, loran, echo-sounder, direction finder, and gyrocompass.

As the term is used in Japan, a "mothership" is a larger vessel that accompanies smaller or catcher boats that do the actual fishing. The "mothership" acts as a carrier for the catch and as a source of supplies. The <u>Kuroshio Maru No. 21</u> does not act as a "mothership" in this sense in that six smaller catcher boats are carried on deck to the fishing grounds. In addition, the vessel is equipped with long-line fishing gear which is fished directly from her own deck.

The trip to and from the Indian Ocean takes about 25 days each way, and the vessel fishes for about 30 days, making the total time for each trip about 80 days. Part of the catch is frozen by mechanical-refrigeration equipment, and the remainder is packed in ice for the return voyage. The catch expected from each trip is slightly over 1,000 metric tons. The owners of the ship state that its operations have been "fairly successful."

Upon the ship's return to Japan, the catch is disposed of through normal commercial channels for the fresh-fish trade, freezing, and canning. While a portion



Kurosnio Maru No. 21, Japan's most advanced type of tuna vessel.

of the catch may be utilized by the owners in their processing operations, the ship is not operated solely for that purpose.

After its return from the present expedition to the Indian Ocean, the ship will be used from May to September in the North Pacific salmon fishery as a cargo carrier.



Mexico

MERIDA SHRIMP FISHERIES TRENDS, OCTOBER-DECEMBER 1955: The Mexican area of Merida in Yucatan, which includes ports on the Gulf of Mexico, exported close to 3.6 million pounds of shrimp to the United States during October-December 1955. Other exports included 61,200 pounds of frozen fish, and 7,000 pounds of shark fins and shark skins, according to a January 27 dispatch from the United States Consul in Merida.

It was reported that production remained good for the quarter, particularly considering that this period was the season of northerly winds. The economic conditions for the area's industry are good although boat construction and heavy spending have started and indications are that many operators are overextending themselves financially.

Average prices f.o.b. Brownsville for frozen 15-20 count brown shrimp for the period under review were: October, US\$0.59; November, US\$0.69; and December, US\$0.73.

It was reported that a new Mexican company will start shrimp operations in the near future off the coast of Campeche with a capital of 2 million pesos (US\$160,000), and with its own fishing boats. Many of the fishing boats based at Tampico have left that port due to the destruction of the packing plants by the fall 1955 hurricanes. The shrimp boats are establishing their bases at Ciudad del Carmen, Campeche, temporarily.

Norway

FROZEN-FOOD CONTAINER TESTED: Norwegian State Railways are testing a specially-designed insulated container for transporting quick-frozen foods, primarily fish fillets. The container weighs slightly over 1.5 metric tons and can carry more than 4 tons. Dry ice helps to maintain a constant temperature of about -13 F. Chief advantage is that the packaged food can be delivered directly from the freezing plant to the point of destination without reloading.

Four of these containers fit on top of a railway flat car, or they can be transported by truck, with each semitrailer accommodating 2 containers. So far, the results have been very promising. At the present time, the test is limited to one container, but the State Railways have three more under construction. Eventually they are expected to speed up the transportation of deep-frozen fish to many parts of East Norway, reports the February 9 News of Norway, issued by the Norwegian Information Service.

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FISHERMEN'S LOAN FUND FOR NYLON NETS: During a recent session the Norwegian Parliament discussed the advantages of nylon nets and the need for making it easier for Norwegian fishermen to obtain them. As a result, the Parliament voted that US\$700,000 be made available in the budget for this purpose. The funds are placed at the disposition of the State's Fisheries Bank for loans to fishermen who wish to secure nylon nets for cod or pollock fishing, reports Fiskaren (December 7, 1955), a Norwegian fishery periodical. The loans can cover 75 percent of the cost of the nets.

* * * * *

AGREEMENT ON SALTED HERRING EXPORTS TO RUSSIA: Recent negotiations between Norway and Russia have resulted in a trade agreement for the export to Russia of 50,000 metric tons of saltherring in 1956. This is approximately the same amount that was exported to Russia in 1955. The Norwegians obtained a slight price increase of about US\$0.28 a ton over the 1955 price, states a February 3 report from the United States Embassy in Oslo.

<u>LICENSING AND TAXING OF FOREIGN FISHING VESSELS</u>: Regulations for the issuance of fishing permits for foreign vessels is the purpose of Supreme Decree No. 22, dated January 5, 1956, and published in El Peruano at Lima on January 17, 1956. These regulations established a procedure for licensing and taxing foreign vessels operating in what Peru regards as its jurisdictional waters. Although not defined in this law, Peru elsewhere asserts jurisdiction over the waters 200 miles off its coastline. The preamble of the Decree points out that it is necessary to establish norms under which permits can be given to foreign flag fishing vessels which desire to fish in waters under national jurisdiction, for the purpose of protecting and conserving the use of the living resources of the sea essential for national life, to the end that they may be exploited only in a manner not causing detriment to the country's economy or its food production.

Article 1 indicates that the Government may grant permits to foreign flag fishing vessels to operate in Peruvian jurisdictional waters.

Article 2 points out that the regulation does not apply to foreign flag vessels contracted to work for the benefit and use of national companies with industrial plants established in the country and which deliver the fish produced to such plants; nor to vessels which come exclusively for the purpose of supplying fresh fish to national consumer markets since regulations for these types of vessels already exist.

Article 3 provides that the Permanent Commission (Peruvian Section) of the Conference for the Exploitation and Conservation of South Pacific Maritime Resources in accord with pertinent studies, may dictate conservation measures which fix or limit the annual fishing quota. In this case permits will not be granted to a

larger number of vessels than that determined each year by this Commission. When quotas are established for issuance of permits to foreign flag vessels, the interests of applicants who have previously operated in the zone will be given consideration.

According to Article 4, permits will be granted only for tuna and skipjack fishing. and for the appropriate bait fishes. Fishing for other species will only be authorized in those cases indicated in Article 2.

Article 5 points out that to operate in Peruvian jurisdictional waters, foreign vessels must have obtained previously a Registration (Matricula) and a Fishing Permit (Permiso de Pesca). The registration will remain in effect for one calendar year. The permit will be valid for 100 days from the date of its issuance.

Article 6 provides these fees for the registration: each ship will pay the sum of US\$200 and for the fishing permit will pay the sum of US\$12 per net registered ton, an amount which may be modified in accordance with fluctuations in the value of the product in the international market...

Articles 7-9 indicate the procedures for applying for the permits, the documents needed with the application, and where the permits are obtainable.

Article 10 states that permits will be issued for refrigeration (freezer) ships only when these act as motherships for fishing vessels authorized to fish in accordance with the present regulation. These ships in applying for a permit will pay only the value of registration set forth in Article 6 being exonerated from payment of the fishing permit, but the fish which they receive will pay the same export duties established for fish which national companies export.

Article 11 provides that ships which are registered and while on the high seas wish to fish in Peruvian jurisdictional waters without having previously obtained a fishing permit, may communicate their desire by radio before entering Peruvian waters, being obliged to set their course immediately to the nearest major Peruvian port in order to obtain the fish permit in the form provided by the present regulation. In this case, the ship in question will be relieved of the documentation which the Codes and Regulations provide for foreign flag vessels entering Peruvian ports.

The balance of the regulations spell out some extensive obligations and duties of permit holders, indicate the penalties for violations, and point out that the funds collected for fishing permits and registration will be deposited in an account which will be called "Funds for hydrobiological investigations."



Portugal

 $\label{eq:fisher} \begin{array}{ll} \underline{FISHERIES} \ \ \underline{TRENDS}, \underline{SEPTEMBER} \ 1955: \underline{Sardine} \ Fishing: \ The Portuguese sardine fleet in September 1955 maintained the high catch level attained during the preceding months of the 1955 season. The September 1955 catch totaled 15,976 metric tons (exvessel value US$1,737,000) of which 8,889 tons were purchased by the canners at a cost of US$1,015,000. The balance of the catch was practically all used by the fresh fish trade. The port of Matosinhos lead all others with a catch of 10,869 tons of sardines and contributed 6,151 tons (exvessel value US$615,000) to the canning trade. \\ \end{array}$

Other Fishing: The landings of fish other than sardines totaled 1,993 tons, valued at US\$218,000 ex-vessel. The catch of fish other than sardines was 67.4 percent chinchards (1,343 tons), followed by anchovy (359 tons), mackerel (152 tons), and tuna (137 tons). The fishery for bonito was about ended for the season and only 2 tons were reported, the December 1955 Conservas de Peixe reports.



Spain

SHRIMP FISHERY: Three species dominate the commercial shrimp catches of Spain. These are: the "gamba" (genus Penaeus); the "carabinero" (genus Aristeomorpha); and the "quisquilla" (genus Crangon), with a small percentage of the genus Palaemon. The entire catch is consumed in Spain, states a February 6 report from the United

States Embassy in Madrid. The shrimp is either shipped as caught; or boiled, packed in coarse salt, and shipped in small boxes of about 11 pounds to the consuming centers.

Table 1 - Spain's Shrimp Catch, 1952-54 1954 | 1953 1952 Species ... Metric Tons ... 10,824 | 8,122 9,247 Gamba..... 849 872 970 Carabinero Quisquilla 160 286 211 Total 11,856 9,378 10,307

Although there are no official figures which could reveal any exportation (the official customs statistics included

canned shrimp among "all canned fish and seafood, excluding anchovies, sardines, and tuna"), all trade sources agree that the entire catch is consumed in Spain and that no canning is carried on.

The fishing area for both the "gamba" and the "carabinero" is the southwestern coast of Spain, between the South of Portugal and the Strait of Gibraltar, with the port of Huelva as the center. Between 75 and 83 percent of the total Spanish catch of "gamba," and between 80 and 85 percent of that of the "carabinero" is obtained there. The fishing area for the "quisquilla" includes two different shorelines: the eastern coast with Barcelona and Valencia as centers, where between 65 and 80 percent of the total catch is accounted for, and the northwestern shores, where practically all the rest of the catch is obtained.

The fishing seasons are: February through June for the "Gamba;" June through August for the "Carabinero;" and the cold months of October through February for the "Quisquilla." The vessels used are trawlers that are also engaged in other fisheries.

The total annual value of the shrimp catch is estimated to be close to US\$4.2 million and prices per pound ex-vessel vary between US\$0.26 and US\$0.68. The average sizes of the shrimp (heads-on) are: Gamba, 38; carabinero, 18; and quisquilla, 105 to the pound.



Union of South Africa

<u>PILCHARD SURVEY PROGRESS REPORT</u>, 1954-55: The Union of South Africa's pilchard investigations for the fifth year (April 1, 1954-March 31, 1955) continued to follow the original scheme of research, according to the Director of Fisheries. A summary of the findings of the fifth year's investigations was presented in the December 1955 issue of The South African Shipping News and Fishing Industry Review.

Physical Environment: The sea area covered by the research vessels along the West Coast is discussed as a whole and as three subareas, viz., the outer, intermediate, and coastal areas. The commercial fishing area coincides mainly with the coastal area. The intermediate and outer areas are of great importance because of their direct influence on the water conditions near to the coast,

The following facts emerged from the year's work;

(1) The annual averages of temperature and salinity at the surface throughout the whole area did not differ materially from those of the previous year, but both were lower than the five-year average. The inorganic phosphate was lower than

in the previous year but slightly above the five-year average. $% \left(1\right) =\left(1\right) \left(1\right)$

(2) In the 0- to 164-foot layer the annual averages of temperature and salinity were both higher than in the previous year, the average temperature being less than the five-year average. The inorganic phosphate was less than in the previous year but equal to the five-year average.

(3) Subsurface currents were more in evidence in 1954/55 than in 1953/54.

(4) In 1954/55 the average temperatures of the surface and the 0- to 164-foot layer in the outer area and part of the intermediate area were the lowest yet recorded, while the salinity was about

the average of all years except 1951/52. In the coastal area the temperatures in both the surface and in the 0- to 164-foot layer, while higher than in 1953/54, were about the same as the five-year averages. The salimities, however, were higher than in 1953/54.

- (5) At individual stations the average surface temperatures were lower than the five-year mean everywhere. Salinity and phosphate data, however, did not always fall into line with the low temperatures of the surface,
- (6) It is not yet possible to say whether the annual averages of temperature, salinity, and inorganic phosphate are of significance in determining the distribution and availability of pilchards and maasbankers in the area under investigation.
- (7) The average temperature of the surface layer was colder in the summer of 1954/55 than in any previous summer.
- (8) In the routine area as a whole, the seasons when maximum salinity, temperature, and inorganic phosphate may be expected in the surface are winter-spring, summer-autumn, and winter respectively. Minima tend to be present in summer-autumn, winter-spring, and spring-summer respectively.
- (9) According to drift-card experiments off the west coast, north-going inshore currents were most in evidence in summer, whereas south-going inshore currents were mostly found from late autumn to spring.
- (10) Evidence of anticlockwise tidal currents was found in St . Helena Bay.
- (11) The increased winter outflow of the Berg River considerably diluted the surface salinity inshore as far north as Lambert's Bay.

Plankton: Once again it can be stated that the St. Helena Bay area favored the growth of all forms of plankton which provided the main source of food for the pilchards and maasbankers of the West coast fishery.

The following findings of importance were made:

- PHYTOPLANKTON: (1) Laboratory counts, done on samples from the St. Helena Bay area, showed that heavy blooms of phytoplankton occurred during every month of the period under review except in April, May, and July 1954.
- (2) Some evidence was found which indicated a direct relationship between phytoplankton blooms and the temperature, salinity, and inorganic phosphate content of the water. This relationship is being investigated in detail.
- (3) The concentration of phytoplankton in the commercial fishing area was at its peak in spring and summer.
- ZOOPLANKTON: (1) The composition of the zooplankton by genera was in general similar to that of the previous year.
- (2) The seasonal fluctuations in the quantity of zooplankton in the whole area of research corre-

- sponded with those of the previous year, but the average volume in each season was lower than in 1953/54.
- (3) In the coastal area also the average volume in each season was lower in 1954/55 than in 1953/54. The seasonal fluctuations in the quantity were different in the two years in that summer concentration of 1953/54 was high in relation to the other seasons, whereas the summer concentration of 1954/55 was relatively low.
- The Fish: A considerable amount of data on various aspects of the biology of the pilchard and the massbanker was collected during the year. Unfortunately, it was not possible to analyze in detail the data on the massbanker. Consequently the findings in relation to this species are still rather scant. As regards the pilchard, however, a considerable amount of additional information was obtained from the year's work.

The findings to date in regard to the biology of the pilchard and the maasbanker can be stated briefly as follows:

- (a) REPRODUCTION: Pilchard: (1) The estimated number of eggs spawned by a female pilchard per season is approximately 100,000.
- (2) The size of the fish at first maturity is at a standard length of $^{\frac{1}{2}}$ 18 cm. All pilchards are mature at $^{\frac{1}{2}}$ 21 cm.
- (3) Although the pilchard spawns in all seasons of the year, the main spawning period is from September to February, i.e., the pilchard is mainly a spring and summer spawner.
- (4) The spawning seasons for Union and South-West African pilchards appear to be the same.
- (5) Pilchards move away from St. Helena Bay for purposes of spawning and their incidence in the area of commercial fishing is highest when they are sexually least active. Although spawning takes place in St. Helena Bay, it varies in degree from year to year and the main spawning area is situated offshore, outside the commercial fishing area.

Maasbanker: It has not been possible yet to make a detailed analysis of the data collected in this respect. The indications are that the main reproductive activity occurs in the winter months.

- (b) COMPOSITION OF THE CATCH: Pilchard: (1) The majority of pilchards caught off the west coast of the Union are fish of standard lengths ranging from 21 to 24 cm. This means that the pilchard catch consists mainly of sexually-mature fish. (According to the second Pilchard Research Report for South-West Africa, the commercial catch there consists of smaller fish, mainly in groups of standard length 19,5-22.5 cm. It is likely, therefore, that a considerable proportion of South-West Africa's pilchard catch is comprised of sexually-immature fish.)
- (2) The mean ratio of males to females in the Union's commercial catch is 44:56.
- (3) Evidence obtained from age studies, though not conclusive, indicates that the majority of pilchards in the Union's commercial catch are from three to five years old.

Maasbanker: It has not been possible so far to process the data on the composition of catch for this species.

(c) FEEDING: Pilchard: The previous finding that the pilchard is a plankton feeder with an apparent preference for phytoplankton was confirmed. It is unlikely, however, that definite selection of food organisms is made and the relative absence of zooplankton in pilchard stomachs may be connected with the varying rates of digestion of phytoand zooplankton.

Maasbanker: The findings of the previous year were confirmed. Small maasbanker were found to feed exclusively on zooplankton, consisting mainly of crustaceans such as copepods, amphipods, and euphausiids. Large maasbankers fed on zooplankton, particularly amphipods, and on a considerable variety of small fish. Large maasbankers may be regarded as predators of juvenile pilchards.

- (d) CONDITION FACTOR: Pilchard: (1) Throughout the year the biological condition factor, i.e. the weight length relationship, of male pilchards was identical with that of the females. This finding corresponds with those of the previous years. In general the seasonal fluctuations of the condition factor are as follows: it is high in summer, reaches a maximum in March, declines rapidly during autumn to a minimum in August, and begins to rise again in late spring.
- (2) There appears to be a direct relationship between the seasonal fluctuations of the condition factor and the fatness of the pilchard as indicated by its oil yield. (Data on oil yield were obtained from factory production returns and not by means of laboratory analysis. It is felt that the industrial statistics of oil production may be somewhat misleading because factories do not draw a sharp distinction between oil produced from pilchards and that obtained from maasbankers. The above finding therefore needs to be confirmed by detailed laboratory analysis of the fish.)
- (3) Condition factor shows no apparent relationship with the softness which affects pilchards at certain times of the year.

Maasbanker: (1) The condition factor of the two sexes was identical throughout the year.

- (2) As in the previous year the condition factor was highest in summer, declined in autumn to reach a minimum in winter, and rose again in spring.
- (3) PREDATORS: Pilchard: (1) The Gannet Cape Cormorant and Jackass Penguin are important predators of the pilchard. It is estimated that gannets consume approximately 37,000 metric tons and cormorants about 1,800 tons of pilchards a year in the St. Helena Bay area alone. It has not been possible yet to estimate the quantity eaten by penguins.
- (2) Other important predators of pilchards are snoek, seals, and stockfish.

Maasbanker: Gannets are estimated to consume about 12,000 tons and cormorants about 550 tons of maasbankers a year in the St. Helena Bayarea. The quantity consumed by penguins cannot be estimated as yet.

The Fishery: The landings of pilchard and maasbanker in the Union during the 1954 calendar year amounted to 220,693 short tons of which 91,322 tons were pilchards and 129,371 tons maasbanker. The catches for the past four calendar years are shown in table 1.

Table 1 - Union of South Africa's Pilchard and Maasbanker Catches, 1951-54						
Year	Pilchard	Maasbanker	Total			
1954	91,322	129,371	220,693			
1953	150,987	93,140	244, 127			
1952	187,424	113,136	300,560			
1951	109,610	111,292	220,902			

This table is naturally a temptation for those inclined to theorize in statistics, but in actual fact the figures cast no light on the fundamental question of what effect fishing is having on the stocks. In the first instance, reliable evidence of the level of fishing intensity in each year is lacking, and secondly the distinction between the catches of pilchard and maasbanker is by no means a sharp one. In other words, any attempt to arrive at the catch per unit of effort is in vain. The value of these catch figures lies only in their historic interest and in the fact that they are needed in relation to closing the fishery annually, if it so happens that the permissible 250,000 tons are caught.

The truth of the whole matter is that we cannot begin to understand the population dynamics of the pilchard and the maasbanker unless the following statistics are made available by the commercial fishery:

- (1) Accurate catch returns for the pilchard and the maasbanker, separately.
- (2) Accurate data in respect of the fishing intensity (effort).
- (3) Accurate data on tag recovery, once tagging has started.

Over a number of years these data, when fully processed together with the basic "vital statistics" which are being compiled continuously by us, and coupled with the results of current environmental studies, should enable us to keep a finger on the pulse of the resources.

The above observations show that proper conservation of the resources cannot be achieved on the strength of our present knowledge, i.e. we do not know at which level and in what manner the stocks should be fished to insure a sustained yield of maximum size and quality. But although knowledge in this respect is lacking, it does not necessarily follow that there should be no control over the fishery. On the contrary, there is quite enough justification for control, especially when the economic and social aspects are considered. For the present, therefore, we can do no better than to continue with the somewhat arbitrary system of regulation and regard it as a policy of "precautionary conservation."

Note: See Commercial Fisheries Review, February 1955, p. 69.



United Kingdom

COMMERCIAL FISH LANDINGS AT HULL UP IN 1955: The Hull fleet of 143 distant-water trawlers landed 562.3 million pounds of fish in 1955, or close to 40 million pounds more than in 1954, but about 4.6 million pounds less than in 1952. The Hull fleet in 1955 was smaller by 5 vessels than in 1954, but the size and fishing capacity of the boats more than compensated for the lesser number of fishing craft. In addition to the landings at Hull, trawlers from that port landed about 49 million pounds at Grimsby.

The increased landings were made with shorter trips to the banks, averaging 20.8 days in 1955 as compared with 23 days in 1952. In addition, the catch per vessel per day at sea for the first 11 months of 1955 increased to 13,286 pounds from 11,718 pounds for the same 11 months of 1954.

The over-all average ex-vessel price for fish landings at Hull declined from about 5.81 cents a pound in 1954 to 5.73 cents for the first 11 months of 1955. The average prices are based on not only the sales on the open market, but also those sales made through other channels at lower prices.

The Hull fishing fleet is largely a deep-water fleet and during 1955 landings from the Bear Island grounds doubled, but some increases were noted for landings

from the White Sea and from waters off the Norwegian coast. There was very little production from the Greenland fishing grounds and catches from the Iceland area decreased, states the January 6, 1956 Fishing News, a British fisheries magazine.

Disposition of Hull Fish Lar	ndings, 19	54-55		
Sales to:	Quantity			
bales to:	1955			
	(Millions	of Lbs.)		
Fresh-fish trade	498.4	486.1		
Salt-fish trade	13.5	15.8		
Animal-food manufacturers	9.7	12.1		
Unsold 1/	40.0	7.4		
Condemned 1/	0.7	1.6		
Total Landings	562.3	523.0		
1/ Probably went to byproducts plants.				

The 1955 landings at Hull were absorbed mainly by the fresh-fish trade-498.4 million pounds (see table).

* * * * *

SHRIMP FISHERY OF GREAT BRITAIN: The shrimp fishery of England, Scotland, and Wales is relatively small with annual catches averaging close to 4 million pounds during the 1952-54 period. In British fisheries statistics a distinction is made between the terms "shrimp" and "prawn," with the term "prawn" applied to the varieties commonly referred to as shrimp in the United States. The term "shrimp" is applied to the small varieties common in North Atlantic waters, a February 6 dispatch from the American Embassy in London points out.

The species of shrimp taken include the brown shrimp (<u>Crangon vulgaris</u>), the pink shrimp (<u>Pandalus montagui</u>), and the prawn (<u>Leander serratus</u>). The catch of prawn is light or only about 16,000 pounds a year. The shrimp are taken on both the east and west coasts of England and in a few restricted areas on the Scottish and Welsh coasts.

The principal method of fishing is by beam trawls, varying in width from 18-24 feet; small (25-50) vessels are used. On the northwest coast a "shank net" is used--a rigid-footed dredge net about 12 feet in width which can be drawn by boat or by a horse in shallow water. On rocky bottom near shore, pots and hoop (fyke) nets are used.

The pink shrimp are caught from mid-April to the end of November, the brown shrimp are taken throughout the year, except in very cold weather.

The catch of shrimp in Scottish waters is estimated to average about 224,000 (US\$31,000 exvessel value) a year.

There is no direct form of Governmental assistance for the shrimp fishermen. There is a

England and Wales Shrimp Catch, 1952-54						
Shrin		mp	Prawn			
Year	Quantity 1	Value	Quantity 1	Value		
	1,000 Lbs	1,000 US\$	1,000 Lbs.	1,000 US\$		
1954	4,039	450	17	11		
1953	4,170	400	12	8		
1952	3,790	374	17	11		
1/ Heads	on.					

30-percent import duty on imported shrimp. The shrimp fishermen do not participate in the White Fish Subsidy Scheme, but they may qualify for financial assistance under the White Fish Authority in the formation of fishermen's cooperatives.

Fishermen engaged in the shrimp industry have, in the past, derived benefit from the Inshore Fishing Industry Act in the form of loans and grants for provision of boats and engines, but such financial assistance is now confined to fishermen engaged in fishing for white fish.

The brown shrimp attains a length of 2 to 3 inches (heads on), but the pink shrimp averages only 2 inches in length. Prawns may reach 4 inches.

Shrimp exports are not recorded separately, but as part of the shellfish category. It is believed, however, that limited quantities of shrimp have been exported to the United States during the past two years.

* * * * *

SUBSIDY PLAN FOR CRAFT FISHING WHITE FISH REVISED: Full details of the changes in the rates and conditions of payment of the white-fish subsidy, under the United Kingdom's White Fish Subsidy No. 2 Scheme, 1955, approved by Parliment in December 1955, were announced by the Ministry of Agriculture and Fisheries and the Scottish Home Department. The new rates came into operation on January 2, 1956.

The new scheme provides for grants of 8d. a stone (US\$0.67 a hundred pounds) for drawn fish and 6d. a stone (US\$0.50 a hundred pounds) for fish in the round landed from inshore vessels of 70 feet and under in length.

Up to December 31, 1955, vessels between 70 and 140 feet in length received a flat-rate subsidy of 4d. a stone (US\$0.33 a hundred pounds) for drawn fish landed and 3d. (US\$0.25 a hundred pounds) for fish in the round. These rates were reduced to 2d. a stone (US\$0.17 a hundred pounds) for drawn fish and 1d. a stone (US\$0.08 a hundred pounds) for round fish.

These vessels may also receive payments for each voyage. The voyage rates for steam vessels are to be increased. Those for motor vessels remain unchanged, reports the January 16 issue of The Fishing News.

Other minor changes are the extension of the special rates hitherto paid for Faroese voyages, to Shetland voyages, and to vessels engaged in a hitherto unpractised method of fishing known as three-ship "pair" fishing. Provision is also made for seine-net vessels of 70 feet and under normally making voyages of at least eight days to receive a combination of voyage and landings payments instead of landings payments only as hitherto.

The United Kingdom White Fish and Herring Industries Act, 1953, provides that in order to promote the landings of a continuous and plentiful supply of white fish (all sea fish except herring, salmon, migratory trout, and shellfish), a plan may be made for the payment of grants to the owners or charterers of fishing vessels not exceeding 140 feet in registered length engaged in catching such fish. The 1955 plan revokes the White Fish Subsidy Act in effect during 1955, and provides for payment of grants at revised rates in respect of voyages made and fish landed by vessels fishing the near- and middle-water grounds (between 43 and 63 degrees north latitude, longitude 17 degrees west), and for grants in respect to landings of fish by inshore vessels, during the period beginning on January 1, 1956, and ending July 31, 1956. The conditions under which grants may be paid remain the same as those under the previous plan, save for the provision that seine-net vessels not exceeding 70 feet in over-all length normally making voyages lasting more than 7 days may receive voyage and landing payments on the basis hitherto applicable only to vessels exceeding 70 feet in length.

Note: Values converted to US\$ equivalents on the basis of 1d. equals US\$0.0117.



WHY PORTION CONTROL IS IMPORTANT

The aim of the food service executive is to place before his patrons wholesome food properly portioned and correctly priced for profit; hence the food portion is the key to the entire food-control problem. This is becoming a prime factor in the choice of fish and shellfish purchases by restaurant operators and others concerned with the preparation of volume meals.

The restaurant operator must know the kinds of foods that will sell, the number of portions, and the price of each ready-to-serve portion. With this information, it is possible to begin with purchasing and planning each step of the preparation and cooking process.

Purchase control means regulating the quantity, kind, size, and weight of the materials that $g\circ$ into the finished products. Today, the smart restaurant executive or owner knows that it is difficult to control all of the possible losses in food processing. He, therefore, is increasingly interested in purchasing more ready-to-serve items. Among these are portioned fish, meat, poultry, vegetables, and fruits, as well as ready-mixed and portioned soups, juices, jams, and jellies. All of these items are table-ready or almost so, and lend themselves to very exact portion control.

Processors of fishery products have been leaders in the field of portion processing. As competing foods follow the same trend, there will be increased sales competition. Expanded sales will depend largely upon the ability of the industry to meet the buyers needs and specifications.



Department of the Interior

FISH AND WILDLIFE SERVICE

ALASKA 1956 HERRING CATCH QUOTA RAISED:

Improved conditions in the herring fishery of southeastern Alaska will permit the catch quota for reduction purposes to be increased to 17,500 tons (140,000 barrels) during the 1956 fishing season, the Director of the U. S. Fish and Wildlife Service announced February 16 in an amendment to the Alaska commercial fishing regulations. In 1955, the catch quota was limited to 100,000 barrels.

Of the 1956 total of 17,500 tons, a limit of 6,250 tons (50,000 barrels) will be permited from the important Sitka populations. In addition, two small areas that were previously closed to fishing will be opened this year for the taking of herring for use as bait. One of these areas is in Silver Bay, at Sitka; the other at Fish Egg Island, at Craig. In each area herring fishing is restricted to a take of 125 short tons for bait purposes.

There is no change in the regulations for Prince William Sound and Kodiak.

The Director stated that Service biologists report that Alaska herring are increasing from their low numbers of past years. Natural conditions in Alaskan waters during the past 3 or 4 years have been favorable for the growth of herring, as a result of which an increase in the 1956 supply is indicated. After several public hearings and meetings in Alaska, at which recommendations by interested persons and the findings of Service biologists were discussed, substantial public support of the Service's proposals was voiced.

The Service's proposals for 1956 will prepare the stage for further research to test the effects of fishing on the conservation of Alaska herring by setting aside the Juneau herring population for study purposes. Purse-seining of these fish, except for bait, will be prohibited.

At the same time the Service is allowing limited fishing on the Sitka, Craig, and Ketchikan herring stocks. Careful studies of spawning and population growth will point up the effects on the fishery.

The five-year study program will be carried out with the active participation of herring fishermen, Alaska salmon trollers, and herring bait fishermen. By the end of that time, the southeastern Alaska herring catch will be on a maximum sustained yield basis, insuring the proper conservation of this valuable species.



Eighty-Fourth Congress (Second Session)

Public bills and resolutions that directly or indirectly affect the fisheries



and allied industries are listed—they are shown when introduced; then from month to month the more pertinent reports, hearings, or chamber actions on the bills listed are

indicated; and bills, if passed, are then shown again when signed by the President.

COMMERCIAL FISHERIES NATIONAL POLICY: H. R. 9552 (King of California) introduced in the House February 27; a bill to establish a sound and comprehensive national

policy with respect to the development, conservation for preservation, management, and use of fisheries resources, to create and prescribe the functions of the United States Fish Commission, and for other purposes; to the Committee on Interstate and Foreign Commerce,

Also <u>H. R.</u> 9700 (Pelly), 3/1/56, similar to <u>H. R.</u> 9552; both <u>H. R.</u> 9552 and <u>H. R.</u> 9700 are similar to <u>S. 3275</u>. See Commercial Fisheries Review, March 1955, **p.** 53,

FAIR LABOR STANDARDS ACT AMENDMENT: H. R. 8553 (Roosevelt), a bill to amend the Fair Labor Standards Act of 1938, as amended, introduced in the House January 17. Provides greater coverage for employees of food industries whose activities affect interstate commerce than does the now existing Act. This bill proposes to extend coverage to those persons in industries engaged in "activities affecting commerce," As stated in section 3. (p) of H. R. 8553, " 'activities affecting commerce' includes any activity in commerce necessary to commerce or competing with any activity in commerce, or where the payment of wages at rates below those prescribed by this Act would burden or obstruct or tend to burden or obstruct commerce or the free flow of commerce," In addition, H. R. 8553 would have a specific effect on the fishing industry of the United States. Certain exemptions from the minimum wage provisions and maximum hours provisions of the Fair Labor Standards Act of 1938. as amended, are removed by this Bill. The Fair Labor Standards Act of 1938 is amended by H. R. 8553 by striking out subparagraph 5 of section 13 (a) which provides wage and hour exemptions for "any employee employed in the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, including the going to and returning from work and including employment in the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof;" The Fair Labor Standards Act is further amended by striking out subparagraph (4) of section 13(b), which provides "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof: "be exempt from the maximum hours provisions of the Act. Should the amendments provided by H. R. 8553 be put into effect, all

phases of the fishing industry would be covered by the minimum wage rate of \$1 which goes into effect March 1, 1956, and it would be necessary to compensate all employees in the fishing industry at a rate not less than one and one-half times the regular rate for a workweek longer than forty hours, or a workday longer than eight hours,

February 29: S. 3310 (Mc Namara) introduced in the Senate and similar to H. R. 8553.

FISHERIES STABILIZATION CORPORATION: S. 3339 (Magnuson and Kuchel) introduced in the Senate March 1; a bill to provide for the stabilization of the domestic fisheries industry in the United States through the creation of a Fisheries Stabilization Corporation, to bring about a better balance flow of fish and shellfish and the products thereof in interstate and foreign commerce, and for other purposes; to the Committee on Interstate and Foreign Commerce, The Corporation provided for by this bill would be authorized to take steps to stabilize and revive the fishing industry through the making of loans to fishermen for boats and gear and to fish processors and others engaged in any phase of fisheries activities. The Corporation would have a capital of \$5 million fully subscribed by the Federal Government, and it would be authorized to issue bonds to obtain additional funds to carry on its work.

IMPORT QUOTAS: H. R. 9563 (Mollohan) introduced in the House February 27; a bill to regulate the foreign commerce of the United States by establishing import quotas under specified conditions and for other purposes; to the Committee on Ways and Means. Similar to 12 other companion bills introduced in the House.

NATIONAL FISH WEEK: Senate Committee on the Judiciary on February 27 indefinitely postponed further action on S. J. Res. 89, designating the period October 3-8, 1955, as National Fish Week. This resolution was introduced in the First Session of this Congress.

WATER POLLUTION: H. R. 9540 (Blatnik) introduced in the House February 27; a bill to extend and strengthen the Water Pollution Control Act; to the Committee on Public Works, Similar to several other bills introduced into the House



TRAMMEL NETS

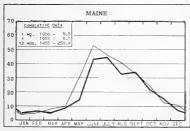
Trammel nets are similar to gill nets, but have two or three walls of netting instead of one. They are sometimes called "tangle nets." Two or three sheets of netting are suspended from a common cork line and attached to a common bottom, or lead line. The outer nets are of fine mesh, loosely hung, while the inner guard nets are usually of much larger meshes. They are so constructed that a fish striking from either side pushes the fine-mesh net through the large meshes and is entrapped in a pocket. Fish caught in trammel nets are oftenalive when picked up, and may be of superior quality for this reason.

--<u>Sea Secrets</u>, The Marine Laboratory, University of Miami, Coral Gables, Fla.

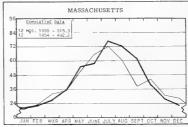


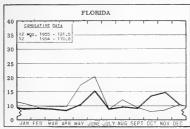
CHART I - FISHERY LANDINGS for SELECTED STATES

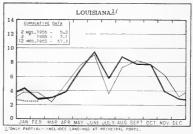
In Millions of Pounds

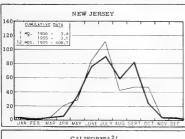


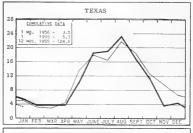












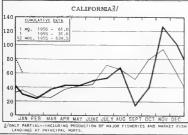


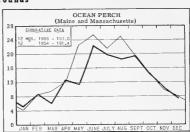


CHART 2 - LANDINGS for SELECTED FISHERIES

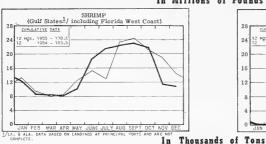
In Millions of Pounds

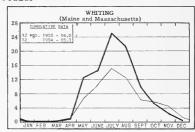
1955 -1954





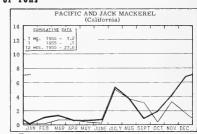
In Millions of Pounds





MENHADEN (East and Gulf Coasts 12 MQS, 1955 - 851,8 12 1954 - 832,5 240 200 160 120 40

MAR APR MAY JUNE JULY AUG SEPT OCT NO



In Thousands of Tons



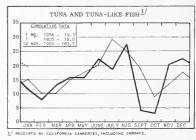
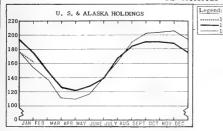


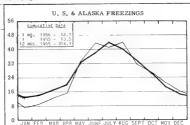
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

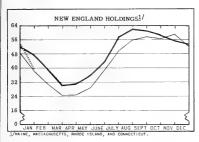


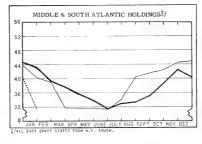
-1955

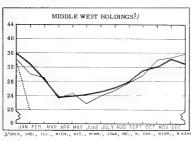
-1954

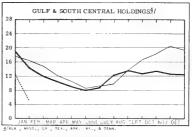


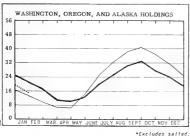










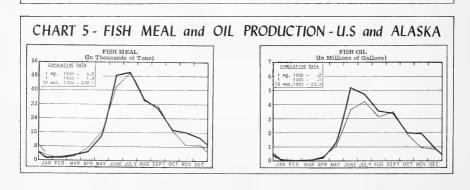




*Excludes saited, cured, and smoked products.

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS In Millions of Pounds RECEIPTS1/ AT WHOLESALE SALT-WATER MARKET COLD-STORAGE HOLDINGS 2/ NEW YORK (FRESH AND FROZEN) CUMULATIVE DATA CITY 2 MQS. 1956 - 23.6 2 1955 - 25.7 12 1955 - 165.4 16 12 10 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OC 2/AS REPORTED BY PLANTS IN METROPOLITAN AREA. RECEIPTS AT WHOLESALE MARKET COLD-STORAGE HOLDINGS (FRESH AND FROZEN) CHICAGO 10 10 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NO JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DE SEATTLE BOSTON WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN) COLD-STORAGE HOLDINGS CUMULATIVE DATA 2 Mgs, 1956 - 9.0 2 1955 - 9.4 12 1955 - 95.7 32 28 16 24 20 16 Legend:

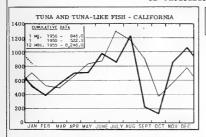


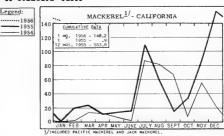
0.1

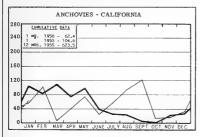
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV. DI

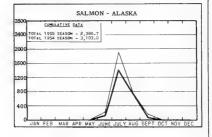
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



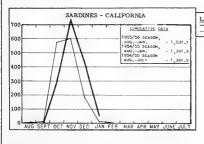






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	STANDARI	D CASES		
Variety	No. Cans	Can Designation	Net 1	₩gt.
SARDINES	100	1 drawn	31	oz
SHRIMP	48		5	oz
TUNA	48	No. ½ tuna	6 & 7	oz
PILCHARDS	48	No. 1 oval	15	oz
SALMON	48	1-pound tall	16	oz
ANCHOVIES	48	½ lb.	8	oz



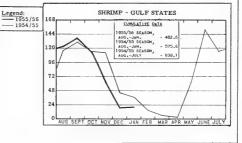
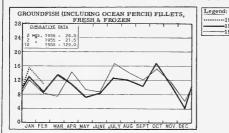
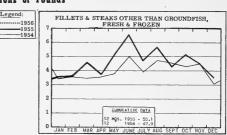
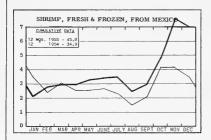


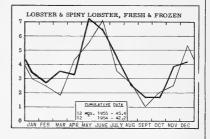
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

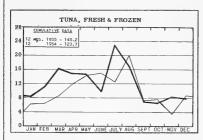
In Millions of Pounds

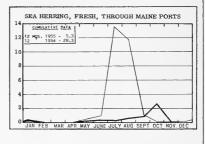


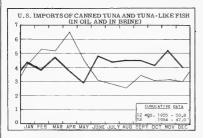


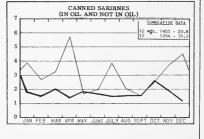














FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIG-NATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA.

S. - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS,
MARKET DEVELOPMENT LISTS

SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number

CFS-1251 - Florida Landings - Oct. 1955, 6 pp. CFS-1252 - North Carolina Landings, Nov. 1955,

2 pp. CFS-1253 - New Jersey Landings - Nov. 1955, 2 pp. CFS-1254 - Frozen Fish Report - December 1955,

8 pp. CFS-1255 - Massachusetts Landings - Sept. 1955,

5 pp. CFS-1257 - Maine Landings - Nov. 1955, 3 pp

CFS-1258 - Rhode Island Landings - Nov. 1955, 3 pp.

CFS-1259 - California Landings - Aug. 1955, 4 pp. CFS-1260 - Mississippi Landings - Nov. 1955, 2 pp. CFS-1261 - New York Landings - Nov. 1955, 4 pp. CFS-1262 - Texas Landings - Nov. 1955, 3 pp.

CFS-1263 - Massachusetts Landings - October 1955, 5 pp.

CFS-1264 - Fish Mealand Oil - Dec. 1955, 2 pp. CFS-1265 - Fish Stick Report - Oct. -Dec. 1955,

2 pp. CFS-1266 - Texas Landings - Dec. 1955, 3 pp. CFS-1268 - Florida Landings - Nov. 1955, 6 pp. CFS-1269 - California Landings - Sept. 1955, 4 pp. CFS-1271 - Rhode Island Landings - Dec. 1955,

3 pp. CFS-1275 - Maine Landings - Dec. 1955, 3 pp.

Wholesale Dealers in Fishery Products (Revised):

SL- 1 - Maine, 1955, 6 pp. SL- 2 - New Hammer 1955, 8 pp. SL- 2 - New Hampshire, 1955, 1 p. SL- 13 - North Carolina, 1955, 6 pp.

SL- 15 - Georgia, 1955, 3 pp.

SL- 17 - Alabama, 1955, 2 pp. SL- 18 - Mississippi, 1955, 3 pp.

SL- 22 - Oregon, 1955, 4 pp.

SL- 24 - Minnesota, 1955, 1 p. SL- 25 - Wisconsin, 1955, 3 pp.

SL- 28 - Michigan, 3 pp.

SL- 29 - Ohio, 1955, 2 pp.

SL- 32 - Minnesota, 1955, 2 pp. SL- 39 - Tennessee, 1955, 1 p.

SL- 41 - Arkansas, 1955, 1 p. SL- 42 - Kentucky, 1955, 1 p.

SL- 43 - Alabama, 1955, 1 p.

SL-162 - Firms Producing Fish Sticks, 1955, 2 pp.

Market Development Lists (Revised): MDL-18 - Iowa Locker Plants, Dec. 1955, 21 pp. MDL-22 - Massachusetts Locker Plants, Jan. 1956, 1 p.

Sep. No. 431 - Florida Fish Marketing Study--Progress Report.

Sep. No. 432 - Michigan Locker Plant Survey. Sep. No. 433 - Research in Service Laboratories (March 1956): Contains these short articles --"Fish Oils in Sprays for Citrus Trees;" "Mid-Winter Status of Southern Oyster Research;" "Utilization of Sea Lions Studied;" "Interim Federal Specification for Canned Crab Meat.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEE CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READ-ILY AVAILABLE, ARE SHOWN.

(Atlantic States Marine Fisheries Commission) Minutes of the 14th Annual Meeting (November 14-15, 1955, Virginia Beach, Virginia), 199 pp., illus., processed. Atlantic States Marine Fisheries Commission, 22 West First St., Mt. Vernon, N. Y. Presents the minutes of the general sessions of the Atlantic States Marine Fisheries Commission which took place November 14-15, 1955, at Virginia Beach, Va.; joint meetings of the North Atlantic-Middle Atlantic Sections and the Chesapeake Bay-South Atlantic Sections; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections.

Bulletin Officiel D'Information du Conseil Superieur de la Peche (Official Information Bulletin of the Council on Fisheries), Number 21, July-August-September 1955, 78 pp., illus., printed in French. Conseil Superieur de la Peche, 1 Avenue de Lowendal, Paris, France.

Bulletin of Tokai Regional Fisheries Research Laboratory (Fisheries Agency), No. 10 (Contribution B), June 1955, illus., printed in Japanese with summaries in English. Tokai Regional Fisheries Research Laboratory, Tsukishima, Tokyo, Japan. A collection of reprints covering the following subjects: marine resources; oceanography; marine propagation; fishing gear and methods; chemistry of aquatic THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

products; and utilization of aquatic products such as food preservation and processing, fish oils and vitamins, and skin and leather of aquatic animals.

"Camera under the Sea," by Luis Marden, article,
The National Geographic Magazine, vol. CIX, no.
2, February 1956, pp. 162-200, Illus., printed,
single copy 75 cents. National Geographic Society, Washington 6, D. C. Describes a recent expedition of the Calypso, a diving rresearch vessel,
to the reefs of the Indian Ocean near Assumption
Island (240 miles from the northern tip of Madagascar) and to the Red Sea, and contains many remarkable photographs in color of the underwater
world.

Canadian Fish Recipes, illus., printed, 25 cents for the set of four leaflets. Queen's Printer, Ottawa, Canada, 1955. A series of bulletins published by the Department of Fisheries of Canada, containing quick and easy recipes for cooking various species of fish: (1) The Way to Cook Fish (baking, frying, broiling); (2) Fresh Water Delicacies (smelt, whitefish, lake trout, pike, pickerel, perch); (3) Oceans of Goodness (cod, ocean perch, haddock, coho salmon, halibut); and (4) The Versatile Cod (freshfillets, salt cod).

(Department of the Interior) 1955 Annual Report of the Secretary of the Interior (For the Fiscal Year Ended June 30), 449 pp., illus., printed, indexed, \$1.25. U.S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, Washington 25, D.C.) This publication contains the annual reports of the various agencies of the Department of the Interior, including the Fish and Wildlife Service. Included under Fish and Wildlife Service are summaries of its various activities. Specifically discussed are utilization of the commercial fishery resources (describes the activities of the Branch of Commer cial Fisheries); management of the Alaska commercial fisheries; Pribilof Islands fur-seal industry; maintenance of inland fisheries; research infishery biology (coastal, inland, marine, and shellfish fisheries); Federal aid to states for the restoration of fish and wildlife needs; international cooperation in conservation (international technical cooperation and conservation agreements); and other activities.

(FAO) Indo-Pacific Fisheries Council Proceedings (5th Meeting, Bangkok, Thailand, 22nd January-5th February 1954), Sections II and III, pp. 113-226, illus., printed, \$1. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955. The full proceedings of this meeting consist of three sections (Section I reports the proceedings). Section II in this issue contains the technical papers presented at the meeting by delegations. Some of the papers relating to commercial fisheries are as follows: "Recent Studies on the Distribution and Migration of Tunas and Related Fishes in Japan" (abstract only), by H. Nakamura; "Fisheries of the Sind Coast" (abstract only), by M. R. Qureshi; "The Shrimp Industry of Singapore," by Tham Ah Kow; "The Prawn Fishery of East Pakistan" (abstract only), by N. Ahmad; "The Efficacy of Some Net Preserv atives on Cotton Twines," by J. I. Sulit and P. Panganiban; "The Relation between Fish Landings and the Refrigeration Industry in Japan" (abstract only), by S. Watari; "Valeur Altimentaire

des Sauces de Poisson" (Nutritive Value of Fish Sauces), in French, by R. Lafont; "The Dried Fish Industry in Cambodia" (abstract only), by Dom-Saveun; "Inshore Fish Population of the Straits of Singapore," by D. W. LeMare and Tham Ah Kow; "Fisheries Radio Network in Japan," by K. Kimura; and "Fisheries Educational Schemes in Japan," by S. Konda. Section III contains papers on marketing of fish as follows: "Fish Marketing and Financing in Australia," by The Commonwealth Fisheries Office; "Some Important Socio-Economic Problems of the Fishery Industries in Japan," by N. Oka, I. Konuma, K. Yamamoto, and M. Abe; "A Note of Marketing and Preservation of Fish in Saurashtra, India," by K. R. Srivatsa; "Problems of Fish Marketing in the State of Orissa, India," by G. N. Mitra; "A Preliminary Report on Lanmadaw Fresh Fish Market, Rangoon, Burma," by U. Ba Kyaw; "The Hong Kong Fish Marketing Scheme," by the Co-operative and Marketing Department; and "Etude sur la Commercialisation des Produits de la Peche Maritime" (A Study of the Marketing of Marine Fishery Products) in French with summary in English, by Tran-van-Tri and P. Gaillard.

Fisheries Year-Book and Directory 1955 (International Reference Book and Directory of the Fishing and Fish Processing Industries), edited by Harry F. Tysser, 446 pp., illus., printed. British-Continental Trade Press Ltd., London, England. (Available in the United States from John D. Griffiths, American Sales Director, British-Continental Trade Press Ltd., 1502 Clegg St., Greensboro, N. C.) A book on the commercial aspects of the fisheries with a wide scope. It is a valuable reference for those interested in the world's fisheries. All phases of the fisheries of the world are touched uponcatch, processing, vessels, gear, research, foreign trade, edible fishery products and byproducts, and recent developments and techniques in various countries.

Articles on certain phases of the fishery industries make up the first part of the book and included are these: "The British Fishing Industry: Comprehensive Review of the Past Twelve Months;" "Notes on English Fishery Research;" "Progress Report from the Torry Research Station and the Humber Laboratory;" "Denmark's Fishing Industry;" "Teeland Fisheries and Exports;" "The Fishing Industry of Western Germany."

The chapter "Around the World" is a survey of the fisheries, fish processing, and trade in Angola, Australia, Belgium, Canada, Ceylon, France, Greece, Israel, Japan, Malaya, Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, the United States, U.S. S. R., and Yugoslavia. Other chapters discuss road and transportation, fish cookery, and packaging in the fishing industry of leading countries. Also included is a fish-supply calendar, tabulated by type of fish, area of catch, and months of supply. Among the lists included are: trade journals of interest to the fishing industry; organizations and trade associations; some fishing vessels recently completed or on order; new marine

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equipment; and a Who's Who of the fishing industry. A dictionary of fish names gives the scientific, French, German, Norwegian, Danish, Swedish, and Dutch names of a considerable number of fish and shellfish. A chapter is devoted to the factory-trawler Fairtry-a vessel of advanced design equipped with an extensive processing plant and arranged for stern trawling.

The second part of the book consists of a directory divided into industry classifications, with the names of firms grouped by countries. Included are: (1) exporters and curers, quick freezers, and trawler owners; (2) importers and wholesalers; (3) fish canners and preservers; (4) machinery and equipment for fish processing, refrigeration, etc.; (5) packing machinery, materials, etc.; (6) ship builders and repairers, ship chandlers, nets and cordage, instruments, and other equipment; (7) fishery byproducts -- meal, oil, vitamins, etc.; and (8) cold storage and transportation. Although these directories do not list many United States firms, the listings for other countries seem fairly extensive. Also included is a list of trade marks, descriptions of the products and merchandise under them, and the producers and distributors using them. The final list in the book is a "Buyers' Guide and Classified List of Advertisers.

Freezing Quality Foods, Bulletin 151, 27 pp., printed. Extension Service, University of Maryland, College Park, Md. Includes, among other items, instructions for the freezing and storage of fish, fish roe, crab meat, soft crabs, oysters, and clams. Seafoods deteriorate rapidly, so it is necessary to obtain absolutely fresh seafood for freezing purposes. Cleanliness is a most important factor in order to have a safe product for consumption. All fresh, firm fish to be frozen should be placed on ice or in a refrigerator as soon as possible after catching and should never be allowed to become warm.

Improved Quality and Packing of Fresh Fish as a Means of Stimulating Consumption, 76 pp., printed. Organization for European Economic Co-operation, 2 Rue Andre Pascal, Paris 16, France, April 1955. (Also available from Publications Office, O.E.E.C. Mission, 2002 PSt., NW., Washington 6, D. C.) The training course summarized in this report is one of a series of 20 training courses and workshops financed by the European Productivity Agency of the Organization for European Economic Co-operation under arrangements with the United States Foreign Operations Administration to promote the exchange of knowledge between member countries in the various sectors of food and agriculture. The present publication, the contents of which are the responsibility of the participants to the course, includes the introductory talks given by the speakers and a summary of the discussions and conclusions reached by the participants at the workshop held in Norway, June 21-26, 1954. This workshop was designed with a view to stimulating fish consumption by raising the quality of fresh fish through the proper training of key people in the best methods

of handling, processing, and transporting fresh fish between the point of landing and the retail destination. The immediate purpose of the workshop, therefore, was to promote a wider dissemination of existing knowledge of improved methods of fresh fish handling and quality inspection, and to encourage the quality inspection services in European countries in their work of helping people in the industry to put the best possible methods to use; further, to allow a free exchange of ideas on common problems relating to handling and inspection practices, and to demonstrate certain types of techniques which have proved their value. This involved short introductory talks (with the use of visual aids), followed by group, panel, and general discussions. The papers presented are as follows: "The Background for and the Importance of Quality Control of Fresh Fish," by Eirik Heen; "Principles and Methods of Quality Con-trol and Inspection of Fresh Fish," by Sverre Hjorth-Hansen; "How to Handle Fresh Fish," by Forde Bramsnaes; "Types of Packing Material and Different Methods of Packing Fresh Fish," by Johan Fredrik Grahl; "The British Fishing Industry Methods of Transporting Fresh Fish from Point of Landing to Destination," by Rodney G. Williams; and "National or International Action to Improve the Quality of Fresh Fish," by Gerhard Meidell Gerhardsen.

An Investigation of the Problem of Guiding Downstream-Migrant Salmon at Dams, by F. J. Andrew, L. R. Kersey, and P. C. Johnson, Bulletin VIII, 69 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1955.

Managing Farm Fishponds for Bass and Bluegills, by Verne E. Davison, Farmers' Bulletin 2094, 20 pp., illus., printed, 15 cents. U. S. Department of Agriculture, Washington, D. C., November 1955. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

"Menhaden, Gold Mine with Fins," by Bill Wisner, article, Fishing Long Island Waters, vol. 7, no. 2, Feb.-Mar. 1956, pp. 13-14, 28, 31, illus., printed. Essy Publishing Co., Inc., P. O. Bldg., Whitehouse Ave., Roosevelt, Long Island, N. Y. Describes briefly the life history of the menhaden, Brevoortia tyrannus, methods of capture, size of the fishery, and industrial uses of the menhaden.

"A New Method of Attaching Petersen Disk Tags with Monofilament Nylon," by John E. Randall, article, California Fish and Game, vol. 42, no. 1, January 1956, pp. 63-67, illus., printed. California Department of Fish and Game, Sacramento, Calif.

Precoked Frozen Foods, 80 pp., illus., printed.
Quartermaster Food and Container Institute for
the Armed Forces, 1819 W. Pershing Road,
Chicago 9, Ill., December 1955. A report of
the symposium on precoked frozen foods,
sponsored by the Quartermaster Food and Container Institute for the armed forces, which was
held in Chicago on May 20, 1954. The purpose

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of this symposium was to learn the present status of knowledge of precooked frozen foods, including fishery products, and to point out the problems remaining to be solved. Papers are presented on the use of precooked frozen foods in the armed services and in industry; preparation and processing of precooked frozen foods; and quality control, stability and microbiological aspects of precooked frozen foods.

"Rearing Larval Scombrid Fishes in Shipboard Aquaria," by Harold B. Clemens, article, <u>California Fish and Game</u>, vol. 42, no 1, January 1956, pp. 69-79, illus., printed. California Department of Fish and Game, Sacramento, Calif.

"Should Shrimp and Game Fishes Become More or Less Abundant as Pressure Increases in the Trash Fish Fishery of the Gulf of Mexico?" by Dr. Gordon Gunter, article, Louisiana Conservationist, vol. 8, no. 4, January 1956, pp. 11, 14-15, 19, illus., printed. Louisiana Conservationist, 126 Civil Courts Bldg., New Orleans, La. The author describes the "trash fish" fishery of the Gulf of Mexico, which is centered about the middle northern Gulf, and summarizes his remarks by saying "(1) There is no evidence that a greatly enlarged trash fish fishery will

have a harmful effect upon sport and commercial fishes or shrimp; (2) There are some indications that any influence of such a fishery will be minor in comparison to other factors now operative; and (3) There are some indications that the trash fish fishery could, conceivably, be beneficial to the shrimp."

(Virginia) Fifty-sixth and Fifty-seventh Annual Reports of the Commission of Fisheries of Virginia (Fiscal Years Ending June 30, 1954 and June 30, 1955), 56 pp., illus., printed. Commission of Fisheries, Newport News, Va., 1955. Describes the oyster, crab, and fishery industries of Virginia and gives statistical data on the number of bushels of oyster shells planted by the Commission of Fisheries in its repletion program. Includes reports of the Superintendent of Hatcheries covering the shad-hatching work on the Chickahominy, Mattaponi, and Pamunkey Rivers for 1954 and 1955. A report from the Virginia Fisheries Laboratory describes its activities for the period July 1953 through June 1955, with special reference to the oyster, blue crab, and migratory fishes. Also shows the revenue derived by the State from the fish and shellfish industries under supervision of the Commission of Fisheries of Virginia and also the expenditures of the Commission.



Editorial Assistant -- Ruth V. Keefe

Illustrator -- Gustaf T. Sundstrom

Compositors -- Jean Zalevsky, Alma Greene, and Helen Joswick

* * * * * *

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VOLUME MARKETS FOR FISHERY PRODUCTS--LOCKER PLANTS

The locker-plant industry is steadily developing into an important volume market for frozen fishery products. Symbolic of this trend is the change in emphasis--a locker plant is now classified in the trade as a "Frozen Food Center."

In a survey of the frozen food centers or locker plants in New Jersey in 1954,U.S. Fish and Wildlife Service fishery marketing specialists found that only 26 plants out of a total of 54 sold fishery products. Yet, these 26 plants sold 163, 970 pounds of fishery products annually, an average of 6,300 pounds a plant each year, or about 525 pounds per plant a month. If each of the almost 11,000 locker plants in the United States were to sell 525 pounds of fishery products a month, the locker-plant industry would provide a market for $5\frac{3}{4}$ million pounds of fishery products a month or 69 million pounds annually. Because of this tremendous potential, the Service's educational and market development program includes working closely with members of this industry.

SHRIMP LANDINGS

The first of a new monthly statistical bulletin-<u>Shrimp Landings</u>-was issued early in March 1956 by the U. S. Fish and Wildlife Service's Branch of Commercial Fisheries in cooperation with the fishery agencies of the Gulf States. This new bulletin will contain information on the quantity and value of the landings of shrimp in

SHRIMP LANDINGS

Department of the Interior Fishery Agencies
Fish and Wildlife Service in cooperation of
Branch of Communical Fisheries with
Washington 25, D.C. the Various States

the Gulf States (Florida west coast, Alabama, Mississippi, Louisiana, and Texas). The area covered will be extended to include the South Atlantic States as soon as it is practicable.

Shrimp Landings, January 1956 (C.F.S. No. 1284) shows that receipts of shrimp in the Gulf States in January 1956 amounted to 5.3 million pounds

(heads off), valued at nearly \$3.3 million ex-vessel.

Information is presented showing eight size classifications for each of the three-commercially important species. Although not included in the published report, more

detailed data on the catch by species and size, by depth and area of capture, number of trips, and days fished are maintained on a current basis in the Washington office of the U. S. Fish and Wildlife Service and are available upon request.

Of the total Gulf shrimp landings reported for January of this year, the west coast of Florida ports led with nearly 2.7 million pounds (valued at \$1.8 million ex-vessel). This was 50 percent of the quantity and 54 percent of the value of all shrimp receipts at Gulf ports during January. Texas ports were in second place with 1.4 million pounds, followed by Louisiana with almost 1.0 million pounds.



Shrimp boats tied up at Pascagoula's City Dock waiting unloading or re-icing.

ana with almost 1.0 million pounds, and Mississippi with more than 0.1 million pounds.

The information contained in these reports is collected in connection with detailed, statistical, economic, and biological investigations of the shrimp fishery financed with funds provided by the Saltonstall-Kennedy Act (68th Stat. 376). The data are obtained from shrimp dealers and by personal interviews with vessel operators.

This bulletin is available free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

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MAY 1956

FISH and WILDLIFE SERVICE United States Department of the Interior Washington, D.C.

JOHN L. FARLEY, DIRECTOR



COMMERCIAL FISHERIES REVIEW



Page

A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor H. M. Bearse, Assistant Editor

Mailedfree to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U.S. Department of the Interior, Washington 25, D.C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/31/57)

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COVER: This scene was made during the annual Biloxi Shrimp Festival which features the Blessing of the Fishing Fleet, a symbolic and religious ritual inherited with other European customs. The 1956 event will be staged on Saturday and Sunday, July 28-29, 1956, Biloxi is one of the important shippers of shrimp and oysters in the United States, Hundreds of boats and several thousand workers are employed in the picturesque shrimp and oyster industries at Biloxi, Miss., on the Gulf of Mexico.

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CORRECTION: March 1956 issue: In the listings under "RESEARCH IN SERVICE LABORATORIES," the one on "Mid-Water Status of Southern Oyster Research," should have read: "Mid-Winter Status of Southern Oyster Research,"

COMMERCIAL FISHERIES REVIL

May 1956

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INSURANCE OF FISHING VESSELS: SOME CURRENT PROBLEMS

By Jerome Sachs*

BACKGROUND

Generally speaking, the commercial fishing vessel insurance problem is the problem of safety at sea as viewed from the standpoints of the fishing vessel owner wanting to be insured and of the insurance company being asked to supply the insurance. The insurability of a commercial fishing vessel depends not only on the sea-

worthiness of the vessel but also on whether or not the crew is "seaworthy." Such considerations are involved as the design and structure of hulls; the installation and maintenance of equipment for safe navigation, for fire fighting, and lifesaving; the conduct and qualifications of the crew, etc.

In recent years the experience of insurance companies in their commercial fishing vessel business has been discouraging and caused many of them to get out of the market and oth- 1/The losses estimated and still outstanding and unpaid as of December ers to keep out. Rising costs have beset the fishing industry as regards construction of vessels, repairs to vessel, fishing gear and nets, fuel, wages to awards in personal injury claims

Table 1 - Fishing Vessel Hull Insurance, 1946-54 (Gross Premiums, Losses Paid, and Ratio of Losses Paid to Gross Premiums)

Year	Gross Premiums Less Returns	Losses Paid Less Salvage	Ratio
19541/	\$ 633,523	\$ 511,840	$\frac{\%}{80}$
1953	629,057	526,045	83
1952	601,696	816,884	135
1951	833, 447	466,871	56
1950	706,609	417,603	58
1949	637, 929	562,150	88
1948	592, 970	322,589	54
1947	358,028	268, 398	70
1946	307, 848	176,532	57

31, 1954, were reported to be \$320,847. If one adds this loss reserve figure to the losses actually paid out during 1954 amounting to \$511,840. the ratio of losses (incurred) to premiums is 131 percent.

Note: These figures, which were made available by one insurance company, are a recapitulation of fishing vessel Hull-insurance statistics covering a 9-year period (1946-1954). The region included extends from the Gulf crew, etc. Furthermore, court | to New England, from Brownsville, Tex., to Eastport, Me.

have sharply increased. Both the rise in costs and the increase in awards are reflected in the increased claims that insurance companies have been called upon to pay. The few insurance companies which have remained in the market have reportedly raised their premiums, increased the use of deductibles, and imposed more restrictive coverage. The vessel owners affected are complaining that the insurance coverage has become inadequate and its cost prohibitively expensive.

This general situation of restricted coverage and increased insurance cost to the vessel owners, and of increasing reluctance on the part of insurance companies to provide the needed protection, has become acute within the fishing industry, both from an economic and a humanitarian standpoint.

The Federal Government, as part of its program of aiding the American fishing industry through research and development, is financing a nationwide survey of * Director, Insurance Staff, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C.

Note 1: An address delivered at the Annual Meeting of the Virginia Fishermen's Association, Hotel Chamberlin, Old Point Comfort, Va., on February 7, 1956.

Note 2: Also see Commercial Fisheries Review, December 1955, p. 35; August 1955, p. 33,

the problem. I am referring, of course, to the survey being conducted at the present time as to the reasons why so many commercial fishing vessels can no longer obtain insurance coverage on their operations at rates they consider reasonable in terms of their total operating costs, their volume of sales, etc. This survey is being conducted by the Bureau of Business Research in Boston University, in cooperation with the Fish and Wildlife Service of the U. S. Department of the Interior. The results of this survey will not be completed until 1957.

My limited aim in this article will be to offer some comments on certain aspects of the insurance problem and to present some personal current impressions. These comments, for the most part, will be in general terms and not specifically pointed to the different geographical areas or classes of vessels. My work has been in the insurance field generally, not specialized in the insurance of fishing vessels, and it is this general insurance background and experience that I am bringing to bear on the material I have read and on what I have learned from the insurance companies regarding the insurance of these vessels.

COMMERCIAL FISHING VESSEL INSURANCE STATISTICS

Statistics on commercial fishing insurance are not readily obtainable because, among other reasons, the insurance companies have not separated out for publication the fishing vessel figures from their marine figures generally. Nevertheless, I have been able to obtain some insurance company figures showing premiums and

			7	00 01 1 0000		70000	e Premiums						S OOD A TOR	Iuine)	-
Class		1954			1953			1952		_	1951				
	Premiums	Losses		Premiums	Losses		Premiums	Losses	Ratio %	Premiums	Losses				
Menhaden; Marine	211, 201	89,468	% 42	180,963	103,327	% 57	169,854	17,199	10	176,312 300	22,669	13			
Auxiliary Schooners: Marine	324,830	329,752	102	328,490	301,979	92	287, 799	345,121	120	260,421 36	110,630	42			
Trawlers: Marine	19,983	8,464	42	23,775 31	7,472	31	25,907 1,125	7,367	28	23,038	41,470	180			
Miscellaneous: Marine	46,410 128	47,061 4,554		91,841 1,122	66, 111	72	18,508 705	53,818	291	43,431 684	17,861	41			
Shrimp and Sponge, Diesel: Marine	28,880 1,603	22,985 9,500	80 593	934 1,244	46,012 91	4,926	95, 074 1, 931	358, 258 8, 057	377 417	322,907 2,527	268,552 66	83 2,6			
Shrimp and Sponge, Gas: Marine	- 488	56 -	Ξ	19 638	406 647	2,136 101	227 566	23,881 3,183	10,520 562	3,066 725	5,623	183			
Totals: Marine Fire	631,304 2,219	497,786 14,054	79 716	626,022 3,035	525, 307 738	84 25	579, 369 4, 327	805, 644 11, 240	135 260	829,175 4,272	466,805 66	56 1.5			
Class	Premiums	1950 Losses	Patio	Premiums	1949	I Watto	Premiums	1948 Losses	I Batio	Premiums	1947	Ratio	Premiums	1946 Losses	Raft
	\$	\$	%	\$	\$	%	\$	\$	%	\$	\$	%	\$	\$	%
Menhaden: Marine	161,642 333	20,019	12	168,785 1,485	73,629	44	136, 822 84	52,748	39	83,245	17,000	20	68,867 105	9,217	13
Auxuliary Schooners: Marine	200, 204	168,413	84	216,234	340,419	157	212, 141 375	161,483	76	146, 461	133, 094	91	126, 383	69,030	55 -
Trawlers: Marine	42,044 849	24,306	58	45,185 240	28, 432	63	81,741	41,889	51	74,707	98,719	132	75,735	88,908	117
Miscellaneous: Marine	48,092 1,011	4,357	9	32,881	16,551	50	14, 127 2, 426	378	3 -	8, 193 3, 478	3, 162 5, 175	39 149	3,978 3,530	2,027 1,793	51 51
Shrimp and Sponge, Diesel: Marine Fire	244,989 3,657	179,497 9,174		164,513 2,950	99,136 732	60 25	134,038 4,186	54,193 245		28, 250 6, 536	8,588 114	30 1.7	17,567 6,598	5,492	31
Shrimp and Sponge, Gas: Marine	2,261 1,527	4,075 7,762		3,517 1,654	3, 251	92	6, 118 912	2,658 8,995		4,529 2,629	2,546	56	1,128 3,957	- 65	1.6
Totals: Marine	699, 232 7, 377	400,667 16,936	57 230	631, 115 6, 814	561, 418 732		584, 987 7, 983	313,349 9,240		345,385 12,643	263, 109 5, 289	76 42	293,658 14,190	174,674 1,858	59 13

losses which are presented in the statistical tables. These figures shed light on the marine insurance industry's lack of enthusiasm for the fishing vessel business over-all. However, I should like to add that from these figures it appears that in the case of menhaden fishing vessels, the underwriting losses over the last few years have been clearly better than the losses suffered on other classes of fishing vessels. It appears evident that in the accident prevention field, compared to other classes of fishing vessels, menhaden vessel owners have been doing a good job.

Some figures dug out of Government records also bear illuminatingly on the losses revealed in the tables of insurance company figures. For example, about one-fourth to one-third of all of the more important cases of assistance rendered by Coast Guard operational units to all types of vessels in all sizes are estimated to have involved assistance to commercial fishing vessels. About one-half of the fishing vessels assisted by the Coast Guard in 1955 were above 30 tons burden or above 40 feet in length.

CAUSES OF ACCIDENTS

What are the causes of accidents among commercial fishing vessels? The Government reports on accidents are not sufficiently detailed to determine the exact causes of the founderings, strandings, fires, collisions, etc. A very rough estimate of the situation places a range of about one-fourth to one-third of the accidents as due to undetermined causes; somewhat less than one-fourth of the causes are attributed to heavy weather; a range of about one-half to two-thirds are attributed to personnel and material failures.

LOSS-OF-LIFE RATE

How does the loss-of-life rate among fishing vessels compare with the loss-of-life rates in other occupations? In table 3 the loss-of-life rate for persons employed on commercial fishing vessels was estimated on the basis of the total loss of life over an 8-year period which occurred on fishing vessels as a result of marine ac-

cidents, divided by the number of persons estimated to have been employed on fishing vessels. The loss-of-life rates for the seamen serving on United States commercial vessels subject to inspection by the Coast Guard were arrived at in similar manner, by using figures collected during the past 3 years. In each case the figures

Table 3 - Loss-of-Life Rate For Commercial Fishing Ve	
Industry	Loss of Life Per Total Employed
Fishermen on commercial vessels	1/1,000
Seamen on inspected vessels	1/1,800
Mining (industry-wide)	1/1,100
Coal mining	1/760
Logging	1/680
Construction workers	1/1,300
Agricultural workers	1/1,700
Steel-mill workers	1/6,000
Manufacturing workers	1/8,400

should be accepted as estimates based on the best available information. The estimated rates were furnished by the Bureau of Labor Statistics and the Coast Guard.

The comparisons in table 3 tend to lend some support to the conclusion that where emphasis has been placed on safety programs, as it has been in the large industrial organizations, loss of life can be held down even though a particular operation may be of a hazardous nature. Other factors contributing to the high loss of life on commercial fishing vessels come readily to mind, such as the inaccessibility to medical help at sea, etc.

HULL INSURANCE

So far as I have been able to discover, what remains of a fishing vessel Hull insurance market for the whole East Coast, Gulf, and Pacific Coast, is being supplied by four insurance companies. A number of other insurance companies have been in and out of the business during the last few years because of discouraging results. Some insurance companies have continued to supply the coverage in specific cases, despite their reluctance to do so. However, the granting of coverage in such cases is to be regarded as testimony to the skill and resourcefulness of the brokers representing the vessel owners concerned, as well as evidence that these

brokers were probably producing other unrelated business for those insurance companies that was turning out to be profitable.

P & I INSURANCE

There are, at present, I believe, four available Protection and Indemnity (P&I) markets in the United States. Of these, only two write P&I on fishing vessels, but both have pulled out of the New England area. I understand that until recently the P&I market in New England was being supplied by two British insurance companies. Because of persistently bad-loss experience despite what appeared to be a stiff premium rate, one of the two has just pulled out and as of today there is only one British insurance company writing P&I in New England. Again, it should be observed that other insurers, American companies, do have a little P&I in New England written in specific cases as a special favor, etc. But the one insurance company holding itself out as ready and willing to provide "at a price" P&I coverage in New England is one British insurance company.

Turning to the Gulf, the P&I business despite a fairly high accident frequency rate has not, I gather, been bad because claim settlements have been more modest than they are elsewhere. Actually, the P&I loss experience on the Gulf has been better than the Hull, and virtually every insurance company writing P&I on fishing vessels seemingly has a little of this business on the Gulf.

PREMIUM RATES

The operations of insurance companies are regulated by the separate states. However, determining the amount of premium to charge in the case of marine insurance is not regulated but is left to the insurance companies themselves. There is no manual of rates, no statistical rating plan based on a classification or register of fishing vessel risks, to which one can refer to find out what the premium rate will be for a vessel in accordance with class, age, and physical characteristics. It is a matter of negotiation between the vessel owner's broker and the insurance company. In fixing the premium rate, what are the considerations that are taken into account?

First of all the insurance company takes into account its general experience with regard to the class of vessel which the insurance is to cover, as well as the particular area or areas in which the applicant vessel owner will be doing his fishing. Some insurance companies, with their losses in recent years in mind, are now insisting on a complete physical survey of the vessel by a marine surveyor. The survey made also covers navigation, fire fighting, and lifesaving equipment.

The vessel owner's loss record and standing are also taken into consideration. The bad experience of recent years has caused some insurance companies to include a check on the financial standing of the vessel owner. Such matters are gone into as whether the venture is or has been making money, whether the vessel owner is paying his maintenance bills on a current basis, how the vessel is mortgaged, etc. These inquiries have on occasion included checking also on the general reputation of the operating personnel.

Some insurance companies give rate deductions to a fleet based on the number of vessels in the fleet. Other insurance companies do not give so-called fleet credits right off but prefer to let a fleet earn such credits by good experience. Some insurance companies are tending to be increasingly wary of fleet operations in rating vessels. They feel that a number of them are really a loose community of single-vessel ownerships banding together to form a fictitious fleet with the aim of getting preferred rating.

In a case where the insurance company being asked to provide the coverage is not really in the market for the business, but is being pressured by the vessel owner's broker, the broker's general record of premiums and losses on the total business brought by him into the insurance company is also weighed.

With the recent losses in mind, there has been some feeling within the insurance industry that the so-called American Institute Time Hull Form, which is used for large oceangoing tonnage, is not a restricted enough form for small fishing vessels and that it was never designed for small tonnage.

PERSONAL FACTORS TO BE CONSIDERED

From what I have said thus far about the procedures used by insurance companies in determining whether or not to insure and the premium rate to charge, it should be apparent that the character, habits, and mental attitude of the vesselowner and crew--the personal factors--are just as important as the physical nature of

Class	Premiums	Losses Paid	Paid- Loss Ratio	Reserve for Losses Outstanding as of December 31, 1954	Incurred Losses	Incurred Loss Ratio
No. of the desired	\$	\$	%	\$	\$	%
Menhaden: Marine	1,357,691	405, 276	29	112,850	518, 126	38
Fire	2,307	-	- 1	-		-
Auxiliary Schooners:						
Marine	2,102,963	1,959,921	93	187,605	2,147,526	102
Fire	411	-	-	-	-	-
Trawlers:						
Marine	412, 115	347,027	84	9,200	356, 227	86
Fire	2,245	-	-	-	-	-
Miscellaneous:						
Marine	307, 461		68 84	11,092	222,418	72
	13,569	11,522	84	-	11,522	84
Shrimp and Sponge, Diesel:	1 027 150	1 040 712	100.5		1 040 712	100.5
Marine	31, 232	1,042,713 27,979	89	-	1,042,713 27,979	89
	01, 505	21,010	00		21,010	00
Shrimp and Sponge, Gas: Marine	20, 865	42,496	203	_	42,496	203
Fire	13,096	20,652		100	20,752	157
Γotals:						
Marine		4,008,759		320,747	4,329,506	83
Fire	62,860	60, 153	95	100	60, 253	95

the risk. The fact that the vessel will stay afloat is not enough. In evaluating a risk the mental attitudes of the vessel owner and crew are of crucial importance. This aspect of the risk is not limited to the personal or business ethics of the owner and crew, or to dishonesty on their part. Carelessness, which is a matter of mental attitude, most decidedly contributes to a risk and yet does not involve either business ethics or dishonesty.

Let us run over quickly some types of personal conduct and attitudinal factors that make a vessel an unattractive risk to the insurance companies. These include such factors as poor seamanship and poor shipkeeping; carelessness in equipment maintenance; failure on the part of the captain, mate, and engineer to spend more time on safety matters in sessions with the crew, especially at the beginning of the fishing season; failure to train new men in the handling of the purse boat and other small auxiliary craft; maintaining the decks in bad condition; permitting overloaded or poorly-insulated circuits; using gasoline in wood-burning stoves to get fires going more quickly in cold weather; failure to check fuel tanks periodically against leaks; smoking in the engineroom where a gas engine is in operation; discharging

crankcase oil into the bilges, thus increasing the fire hazard; using all personnel on the vessel to help bring in the net, leaving no one on watch in the engineroom; allowing drunks to get on board; venturing out too far looking for new fishing banks considering the size of the vessel and its equipment; staying out until the last moment despite weather conditions, etc.

The list could obviously be extended. The point is that these are the kinds of personal factors that make for injuries, for destruction, and loss of vessels, and thereby for increased losses to the insurance companies.

CAREFUL MEN ARE GOOD INSURANCE RISKS

The nature of insurance is such that it requires the utmost good faith between the parties. The so-called Sue and Labor Clause which appears in every marine insurance policy means in substance that in dealing with an accident or with a loss, the insured vessel owner should act as if he were uninsured. Insurance companies like their policyholders to be not only men of good faith but cautious and careful. It has been said that the best safety device after all is a careful man. Insurance underwriters may be pleasurably excited by risks and chances taken in the movies or on television, but when they catch on to the fact that a policyholder of theirs has a habit of taking unnecessary chances, the show is over; they prefer to let him gamble with his own money and not with the insurance company's.

	Table 5 - Fishi	ng Vessel Prot	ection	and Indemnity Insurance	, 1950-54	
Year	Gross Premiums Less Returns	Losses Paid Less Salvage	Paid- Loss Ratio	Reserves for Out- standing Losses as of December 31, 1954	Incurred Losses	Incurred- Loss Ratio
1954	\$ 72,797	\$ 6,507	<u>%</u>	\$ 30,900	\$ 37,407	% 51
1953	68, 250 47, 286	19,797 45,814	28 96	15, 800 23, 800	35, 597 69, 614	52 149
1951 1950	89, 101 85, 873	69,634 88,141	79 102	9,900	79, 634 88, 141	89 102
Totals Note: Thes	363, 307 e figures, made available by	229, 893 an insurance compan	63 v. are a re	80, 400 capitulation of fishing vessel P & I	310, 393 insurance stati	stics covering

Note: These figures, made available by an insurance company, are a recapitulation of fishing vessel P & I insurance statistics covering a 5-year period (1950-1954). While the region included under these figures extends from the Gulf to New England, about 90 percent is estimated to represent menhaden vessels,

The life of a fisherman is a rough one. It draws courageous and self-confident men; rugged individualists who think of themselves as lone operators and able to take care of themselves in any situation; men with a strong streak of fatalism in their characters. However, men of this kind tend frequently to be disdainful of precaution and to carry around deep within themselves the feeling that it is demeaning ("chicken") to worry about safety--and a waste of time to pay attention to accident-prevention procedures. Therefore, solving the insurance problem becomes for the fishing industry the problem of getting men with these character traits to observe safety precautions persistently and continuously. It is the problem of getting these men to view accident-prevention procedures and equipment on the boat as an essential and integral part of the boat's successful operation, not just as something "ex-ra." Accidents on a vessel not only affect its insurance rate but have an unmistakable and large bearing on the fishing vessel's efficiency.

MEASURES NEEDED TO INSURE SAFETY

The practical question which those interested in the general welfare of the fishing industry (and more specifically in its insurance difficulties) have to face up to is what should be done to get vessel owners to maintain the vessel, its fixed equipment, and safety equipment in as good condition, let us say, as the fishing gear. What courses of action should be taken in an effort to reduce accidents and thereby the losses of insurance companies? Are corrective regulatory safety measures needed? What should be done to keep down court awards in personal-injury actions by members of the crew?

One suggestion that has been made is that Congress should take fishermen out of the Jones Act and enact a fishermen's compensation act to parallel the workmen's compensation legislation that governs the amounts paid for death and injuries to workmen in industrial plants on shore. This would be a statutory approach to fixing a ceiling on amounts paid for death and injuries to fishermen.

Another method for dealing with the problem that has been mentioned is that commercial fishing vessels should be made subject to Government construction and maintenance standards with periodic inspection and certification by recognized surveyors, and that seagoing personnel on fishing vessels should also be made subject to official qualification standards. The aim of these official standards would be to see to it that the commercial fishing vessel is seaworthy, properly equipped for safe navigation, properly equipped with fire-fighting apparatus and lifesaving gear, and properly manned. This course of action would have fishing vessels made subject to the same regulations, more or less, as passenger and cargo vessels.

At present, fishing vessels are subject only to the requirements of the Motorboat Act administered by the Coast Guard. Those motorboat regulations are limited to requiring compliance with certain regulations concerning navigation lights, fire extinguishers, and lifejackets and apply to all motorboats under 150 tons which are not licensed to carry passengers. These regulations have nothing to do with the design and construction of fishing craft. The inspections are not periodic but of a spot-check character. In sum total, these regulations are the same as those which apply to small pleasure craft although the Motorboat Act also contains a few other special provisions, including one requiring officers of seagoing vessels of more than 200 tons to be licensed and a fishing vessel of that tonnage would be subject to such requirement.

FISHING VESSEL SAFETY MEASURES IN OTHER COUNTRIES

I thought it would be of interest to refer briefly in this connection to the course of action other countries have taken in an effort to control accidents and losses on fishing vessels. On looking into the matter I find that many maritime nations, perhaps a majority, have in effect laws and regulations governing the construction, maintenance, and safety of operations of fishing vessels. I should like to sketch briefly the situation existing in this regard in Canada, Great Britain, the Netherlands, and Belgium.

In Canada a fishing vessel in excess of 15 tons gross tonnage is subject to inspection of the hull, machinery, and safety equipment in the manner set out in the Canada Shipping Act and Regulations thereunder. These regulations were prepared in consultation with the Canadian fishing industry. The enforcing Government Department is the Canadian Board of Steamship Inspection.

In Great Britain the laws pertaining to fishing vessels appear to take as their beginning point the background fact that Lloyd's inspects and classifies the larger fishing vessels, for the purpose of fixing rates, in accordance with type of hull structure, physical characteristics, etc. Unless a vessel is constructed in accordance with Lloyd's specifications for that particular class, insurance is unobtainable from a British insurer, or practically so, since the rates quoted without such classification become prohibitively high. With this situation in the background the Government does not, it appears, concern itself with fishing vessel classification or inspection certificates. The only laws and regulations applicable by their specific terms to fishing vessels pertain to fire-fighting and lifesaving equipment. These vessels are not subject to periodic inspection but are inspected at indefinite intervals to see to it that the fire-fighting and lifesaving equipment is as required. If on the occasion of the spot check of the fire-fighting and lifesaving equipment the vessel is noted by the inspector to be in unseaworthy condition, operation is prohibited until the deficiencies are corrected. Despite the absence of a legal require-

ment that these vessels have inspection certificates, the Ministry of Transport nevertheless has general authority to step in to prevent the unseaworthy fishing vessel from operating and generally does so by notifying British customs to withhold clearance.

In the Netherlands, all fishing vessels except undecked vessels fishing within sight of the coast are subject to inspection and require a seaworthy certificate issued by the Shipping Inspection Service of the Ministry of Traffic and Public Works. New construction must be approved. Classification Society Survey Certificates (of approved societies) are accepted in lieu of Government inspection. General examination of hull, machinery, launching gear, radio, outboard fittings, and sea valves is required annually. Manning requirements are specified for seagoing fishing vessels of over 50 tons, based on size and type of vessel and length of voyage. A minimum number of qualified men for watch on deck at sea is also specified.

In Belgium all seagoing fishing vessels are subject to inspection. Certificates are good for 1 year. If a vessel is classified by an approved classification society, its seaworthy certificate is recognized. If not so classified, the inspection service conducts the examination but permits the owner to select the rules of a recognized society which are then used to govern the inspection. In its operational details the scope of inspection and control exercised seems to be closely similar to the setup in the Netherlands. Manning scales are established. Documents are issued for skippers (three grades); qualified sailors, and deck apprentices; and for engineers, assistant engineers, engineer apprentices, and motor operators. Sometimes documents are issued to qualified deck personnel in small fishing vessels not required to have engineers.

CONCLUSION

In conclusion, one thing appears quite clear, and that is if ever laws extending inspection and safety requirements to fishing vessels should be adopted in this country, the system should be reasonable and have as its objective the retention of the bulk of equipment which the fishing industry now has while making it safer for the men. Corrective regulatory measures ought not to place an undue economic burden on the commercial fishing boat owner. Clearly, too, the details should be worked out in consultation with the fishing industry. Consultation with industry was the approach employed in developing the regulations applicable to the other commercial vessels in the American Merchant Marine.

The whole problem of technological change is one of the most disruptive factors to any occupational group. When the change is initiated from within the group, e.g., by suggestions from the industry, there is less chance of disruption. One of the bits of acquired wisdom in regard to introducing technical changes is to introduce them not whole hog, but to gage the rate and speed of change in such a way that the timing takes into account and allows for two types of adjustment: (1) economic adjustment, that is absorption of the cost of safety equipment, etc.; and (2) attitudinal adjustment, the effect on the habits and feelings of the people affected. Therefore, to introduce suddenly and completely a large number of safety regulations would seem undesirable.



SANTIAGO NEGOTIATIONS ON FISHERY CONSERVATION PROBLEMS AMONG CHILE, ECUADOR, PERU, AND THE UNITED STATES

BACKGROUND

Representatives of the United States met with representatives of Chile, Ecuador, and Peru at Santiago, Chile, from September 14 to October 5, 1955, to negotiate an agreement for the conservation of fishery resources of the eastern Pacific. While considerable progress was made in clarifying the views and interests of the parties to the negotiations, the delegations encountered basic problems which stood in the way of reaching agreement and led to the suspension of the negotiations in order that further consideration might be given to those problems in the respective governments.

Behind these negotiations lay a legal controversy between the United States and the Governments of Chile, Ecuador, and Peru with respect to the claims of the three South American countries to exclusive sovereignty over a so-called maritime zone extending not less than 200 miles off their coasts. Claims over such an area had been advanced by Chile and Peru individually in 1947. In August 1952 the Declaration of Santiago was signed by the three South American countries stating 200-mile claims in a joint manner and pledging themselves to collaborate for the protection of maritime resources in the area. Later they agreed not to enter into any international agreements affecting these claims without the concurrence of the other parties to the Declaration. It was because of this pledge that the United States, which first proposed such negotiations to the Government of Ecuador, agreed to negotiate simultaneously with all three South American Governments.

Despite United States protests against the claims of the three countries, which were directly in conflict with the well-established principle of the freedom of the seas, various actions by Ecuador and Peru sharpened the legal controversy. Fishing vessels of United States registry operating on the high seas off the coasts of Ecuador and Peru during 1954 and 1955 were seized and subjected to fines or taxes, or were otherwise molested. These incidents culminated in the seizure in March 1955 of two United States fishing vessels some 25 miles from the coast by an Ecuadoran patrol boat, in the process of which an American seaman was seriously wounded by gunfire.

Various high officials of the Governments of Chile, Ecuador, and Peru assured representatives of the United States that the sole purpose of the claims to sovereignty over the high seas set forth in the Santiago Declaration was to insure the conservation of the living resources of the sea which the three coastal countries considered essential to their economic development and their future welfare. The United States, in accordance with its well-established policy of promoting the conservation of fishery resources, therefore made a dual proposal to the three countries in a note handed to their Foreign Offices by the United States Embassies on May 13, 1955. In this note the United States proposed that the dispute over the claims by those countries to sovereignty and jurisdiction over the ocean to a distance of 200 miles from their shores be submitted to the International Court of Justice, and that negotiations be entered into between representatives of the three countries and the United States for the conclusion of an agreement for the conservation of fishery resources in which the four countries had a common concern. Such an agreement would not refer to the extent of territorial waters

would not refer to the extent of territorial waters.

17 Reprinted from The Department of State Bulletin, vol. XXXIII, no. 860 (December 19, 1955), pp. 1025-1039.
Note: Also see Commercial Fisheries Review, September 1955, pp. 1-13.

In their response to this note, the three South American countries on June 3, 1955, replied that they were not prepared to consider at the time whether or not the legal controversy should be submitted to the International Court of Justice (none of them having accepted the compulsory jurisdiction of the Court) but that they were prepared to initiate jointly the proposed negotiation of a conservation agreement.

U. S. AGREES TO NEGOTIATIONS

In a further note handed to the three Governments on July 9, 1955, the United States expressed regret at the unreadiness of the South American countries to submit the legal controversy to the International Court of Justice. The United States agreed nevertheless to open negotiations with the three countries for an agreement for the conservation of fishery resources of the eastern Pacific Ocean in general conformity with the conclusions on technical aspects of fishery conservation approved by the United Nations International Technical Conference on the Conservation of the Living Resources of the Sea (Rome, April 18-May 10, 1955). It was stated specifically that any such agreement would have to be drafted without reference to the claims of any of the four Governments with respect to territorial waters or other forms of special jurisdiction over the seas adjacent to their coasts.

After the formal opening of the negotiations on September 14, 1955, by His Excellency Rear Admiral Kare Olsen Nielsen, Foreign Minister of Chile, the question of how to proceed with the negotiations was discussed. The United States delegation proposed the following three points, to be discussed in the order indicated:

- 1. Consideration of the principal fishery conservation problems of the southeast Pacific of concern to the participating governments;
- 2. Examination of existing types of conservation measures and procedures that might be useful in solving these problems;
- 3. Type of agreement that would be required for satisfactory resolution of the conservation problems confronted, and provisions of such an agreement.

Two days later the delegations of Chile, Ecuador, and Peru, who acted in concert throughout the negotiations, replied that in their view the negotiations could be better facilitated by the immediate submittal by the United States of proposals for a conservation agreement. The delegations of these three Governments (which became known as the CEP delegations) also urged that in making any such proposals the United States take into account the desirability of preventing repetition of incidents such as those which had taken place involving United States fishermen during the past months.

U. S. PROPOSALS FOR CONSERVATION AGREEMENT

Accordingly, on September 20 the United States delegation presented to the other delegations a full statement of its understanding of the problems of fishery conservation in the southeastern Pacific, insofar as the United States had an interest therein and knowledge thereof, and submitted, on the basis of this understanding, its proposals for a conservation agreement.

In these documents the United States pointed out that its principal concern was with the stocks of yellowfin, skipjack, and big-eyed tuna and with small bait fish used in catching the tuna. The distribution of these stocks of tuna in the Pacific Ocean was described in relation to ocean current systems. Data concerning the condition of these stocks of tuna were referred to, emanating principally from the studies carried out by the Inter-American Tropical Tuna Commission.

The work of the Inter-American Tropical Tuna Commission was discussed, and the United States delegation pointed out that the convention which established that commission included, in its opinion, all or most of the provisions needed to handle the joint conservation problems of tuna and bait fish. However, since the CEP countries had not accepted an earlier invitation to join in this cooperative project for stocks of fish extending into the waters off their coasts, it appeared that they found the convention inadequate in one or more respects. The United States delegation stated that if they would explain these deficiencies, it would help in determining the type of agreement which would be satisfactory.

With reference to the drafting of a conservation agreement the United States delegation set forth its main ideas in document 7, and later in document 9. These documents outlined a conservation program involving the establishment of an international commission on which each participating state would be represented by a national section having one vote. The commission would carry out scientific research on stocks of fish of interest to two or more member states. In the discussion it was made clear that a state would be considered as having an interest in the conservation of a stock of fish either when it participated in the fishing of such stock or when such stock occurred in waters adjacent to its coast. The expenses of the commission with respect to any specific research program would be allocated to the member countries in relation to their share of the total catch of that stock of fish. The commission would be directed to determine, on the basis of scientific investigations, what, if any, conservation measures would be required to make possible the maximum sustainable productivity of a given stock of fish and to recommend the adoption of such measures to the Governments. Decisions of the commission were to be taken by agreement among all the national sections, but in the event of a failure to reach agreement, technical issues could be submitted to an arbitral procedure for a final settlement.

When the commission, either as a result of its own decision or of the arbitral findings, recommended conservation measures to the member states, these would go into effect automatically within a certain period of time unless a country objected. In the event of such objection, the United States proposals suggested the issue could again be submitted to an arbitral procedure for decision, and the award in this case would become binding upon all member states.

AVOIDING FURTHER INCIDENTS

The proposals incorporated in the documents referred to set forth the United States position. However, an additional oral statement at the meeting of September 20 was made in reply to the CEP request that consideration be given to means of avoiding further incidents. The United States delegation suggested that the conclusion of a conservation agreement along the lines proposed would greatly help avoid further incidents by providing for international regulation of vessels of the parties fishing in the waters off the coasts of the CEP countries. Rules would be established by agreement among the countries on the proposed international commission and, in the view of the United States, should be enforced by each Government against its own vessels. The United States delegation observed that it had noted with interest the statements of officials of the CEP Governments that the consideration which should govern activities of foreign fishermen in the waters off their coasts should be that they conform to rules for the conservation of the species, and suggest that so long as the commission established such regulations by agreement of all member states, no further difficulties regarding their adoption and validity should be encountered.

The United States proposals did not, however, prove acceptable to the CEP countries. On September 23 they stated their disagreement therewith and proposed certain alternative ideas differing in various respects from those advanced by the

United States. A major difference in the proposals put forth by the CEP countries had to do with the role assigned to the coastal state in enforcing any conservation measures which the international commission might propose, or which the coastal state itself might wish to put into effect. The CEP countries wished to have the agreement recognize the right of the coastal state to exclusive control of fisheries out to 12 miles from its shores and also in areas which each coastal state would unilaterally designate as constituting "areas traditionally exploited" by it. These areas would, judging from illustrative material presented during the negotiations, extend 50 to 60 miles beyond a 12-mile zone and cover most of the desirable fishing grounds off the coasts of the three South American countries. Fishing within these two classes of areas was to be controlled by licenses issued by the coastal state. In the remainder of the area covered by the proposed agreement, fishing for tuna and bait fish would be permitted subject to existing conservation regulations which would presumably include not only those established by the new commission but also apparently regulations promulgated by the three South American States either individually or jointly. Moreover, Chile, Ecuador, and Peru wished in essence to have exclusive jurisdiction to enforce the regulations within a 200-mile zone and, further, to occupy a preferential position with respect to any quotas governing the quantity, kind, etc., of fish taken which might be established pursuant to the conservation program.

The negotiations at this point began to focus upon what proved to be an insuperable obstacle, namely, the insistence of the CEP countries on inserting in any agreement provisions which would in effect recognize their claims to exclusive jurisdiction over large areas of the high seas off their coasts. The U.S. delegation pointed out that the authority to license fishing operations would involve the authority not only to determine the fees and other conditions of the licenses but also the authority to withhold them completely.

Moreover, the U. S. delegation pointed out that these provisions were in no sense required for the effective execution of a conservation program. In support of this point the United States amplified and clarified its proposals regarding the controversial issues. It stressed that effective enforcement could be achieved by agreement on the provisions which would accord to the properly constituted authorities of any contracting party the right to board any fishing vessel flying the flag of a contracting party within the convention area if there were reason to believe that a conservation regulation was being violated, and, if supporting evidence was found, to take the vessel into the port and prefer charges against it. It urged that at this point the vessel should be promptly turned over to officials of the country of registry for trial and, if guilty, for punishment of the offense. It was pointed out that this system had been incorporated satisfactorily in several other international fishery conservation agreements.

Furthermore, in order to avoid damaging the juridicial position of either side, the United States delegation proposed that an article be adopted in the convention clearly stating that it was being entered into "without affecting the position of any contracting state in regard to territorial waters."

Finally, the United States, while unable to accept the idea of exclusive jurisdiction by the coastal state over the "traditional" fishing areas which it might unitaterally declare, made a substitute proposal. It agreed to consider any proposals which the CEP countries might wish to advance to take care of special problems or situations involving small coastal fishing villages in the CEP countries which were dependent directly upon the sea for their sustenance. This proposal was justified on humanitarian grounds. The United States delegation insisted, however, that any cases falling under this general proposal would have to be supported by a factual showing of the dependence of the community upon the sea for its sustenance. This proposal did not prove to be of interest to the CEP states.

CEP DRAFT CONVENTION

At the same meeting at which the United States submitted its document 9, the CEP countries presented a complete draft convention, modifying in some respects their early proposals. However, the same fundamental obstacles to agreement remained, namely the desire of the CEP states to assert exclusive jurisdiction over large areas of the high seas off their coasts. A new thought was introduced in regard to the trial of alleged violations. The CEP draft suggested the setting up of a special jurisdiction under which the national section of the state making the arrest would try the vessel charged with an offense by means of administrative procedure and would impose penalties. It was further suggested that should the alleged offender wish to appeal he could do so to a special tribunal made up of the two national sections of the commission other than those representing the country of the alleged offender and the country of the arresting officer. In view of the bilateral character of the agreement proposed by the CEP countries, with Chile, Ecuador, and Peru identified as one party, and the United States identified as the other party, this procedure would, in most cases, result in two members of the same party hearing appeals from decisions in which the other member of that party was involved.

NEGOTIATIONS SUSPENDED

At this stage it became clear that the negotiations had proceeded to a point which exhausted the capacity of the delegations to reach agreement within their instructions. The issue posed by the insistence of the CEP countries on exclusive jurisdiction over areas which the United States considered to be high seas in accordance with existing international law was apparently insuperable. The proposal for special tribunals to try offenders posed problems which would at the very least require careful and extended consideration, certainly within the United States Government. The proposals of the United States with respect to policing and enforcing the area likewise proved to be beyond the authority of the CEP delegations to accept. Accordingly, a decision was made to suspend the negotiations and a communique was issued announcing this decision.

Differences in the interpretation of scientific information were also brought out in the course of the negotiations. The CEP countries in their document of September 23, advanced a theory of "eco-systems" and "biomas" according to which the interdependence of life on the coastal land with the living communities of the sea, plus the geographic, hydrographic, climatic, and other environmental factors influencing both, were said to create a relationship of such unity as to serve as a scientific basis for the legal claim of coastal states to preferential rights over adjacent waters. The United States delegation challenged this concept, pointing out that the idea of the existence of a perfect unity and interdependence between the communities that live in the sea and the coastal populations could have at most limited, if any, validity, such as for example in the well-known case of the guano bird populations of Peru. It stated that, on the contrary, conditions responsible for the existence of rich marine life in the area off the west coast of South America were the result of meteorological and oceanographical factors originating far from those areas--factors such as major wind systems of the Pacific and the interplay of its great oceanic currents. It also pointed out that many stocks of fish of greatest importance, such as tuna, moved widely over a broad area through and beyond the "biomas" of the area in question and that the interrelated communities of living organisms of the ocean, moreover, certainly bore no relationship to national boundaries as established by man on the land.

Such differences were in part responsible for a substantial variance of opinion regarding the area to be covered by the proposed conservation agreement. The United States urged that, since some of the most important stocks of fish to be conserved (yellowfin and skipjack tunas) ranged all the way from the waters off Chile

north to California, the convention should cover this entire area and be open to adherence of other American coastal states contiguous to these waters. Otherwise, only divided and therefore less effective attention could be given to those important stocks of fish. The CEP countries made it clear, however, that their interest was confined to waters off their coasts and that they were not prepared to enter into a broader agreement. The United States finally stated that, if the CEP states found it impossible to participate in a broader arrangement, it would, should other outstanding differences be resolved, agree to work out with them a convention limited to the four negotiating states. However, in that case the United States would suggest certain changes in the functions to be assigned to the proposed commission to avoid conflict or duplication with the research activities of other organizations.

PURPORT OF 1945 PROCLAMATION

The United States delegation was interested to note during the course of the negotiations that official or public opinion in the CEP countries labored under considerable misunderstanding in respect to facts relating to United States policy regarding fishery conservation. For example, the purport and effect of the proclamation issued by the President of the United States in 1945 concerning fishery conservation was widely misinterpreted as constituting a precedent for unilateral claims to large offshore areas of high seas for conservation purposes. The United States delegation repeatedly made clear that the United States through the Truman proclamation did not claim exclusive jurisdiction over the high seas off its coasts but on the contrary recognized that when foreign fishermen participated in fisheries off the coast of the United States beyond the 3-mile limit, conservation regulations would be worked out with the agreement of the governments concerned. It explained that only when United States nationals alone were involved would the United States establish the conservation regulations unilaterally in the exercise of the right of any government to regulate its own nationals on the high seas.

Another misconception of United States policy at times reflected in statements appearing in the local press during the course of the negotiations was that the United States represented those countries which wished to be free to fish without restraint anywhere in the world, as opposed to the CEP countries, which represented the desire of other states to protect and conserve fishery resources. The United States delegation took such opportunities as it could to reiterate the firmly established policy of the United States to promote the conservation of fishery resources in which it had an interest in any area of the world. It was pointed out that the United States had in fact entered into more international agreements for the conservation of fishery resources than any other country. The regulations under these conservation agreements have proved highly beneficial to the fisheries concerned and thereby demonstrate to interested people in the United States, especially its fishermen, the positive value of effective conservation programs. The initiative taken by the United States in establishing with the Governments of Costa Rica and Panama the Inter-American Tropical Tuna Convention (which is open to adherence by other interested states) has produced the most extensive and useful series of conservation studies that have been developed for any stocks of fish in the southeast Pacific. The work of the Inter-American Tropical Tuna Commission has already established a firm basis of knowledge concerning the condition of these stocks of fish and has placed the commission in a position to devise and recommend conservation regulations at any time, should the condition of these tuna stocks indicate such measures to be necessary.

In the course of the Santiago negotiations the United States made every effort to include in its proposals for a conservation agreement measures and procedures adequate for the cooperative activities necessary to assure the continued productivity of the stocks of fish in the eastern Pacific Ocean of interest to the four countries. Such an agreement would make the participating countries full partners in a conservation program involving effective research, recommendations for conservation

based on scientific data, and enforcement of necessary measures. However, it was not possible to conclude such an agreement owing to the inability of the delegations of Chile, Ecuador, and Peru, without further consultation with their respective Governments, to negotiate an agreement which did not include provisions in effect giving recognition to their claims to exclusive jurisdiction over large areas of the high seas off their coasts.



HANDLING BAIT SHRIMP

To handle bait shrimp properly the shrimp must be in good condition when transferred to the holding tanks or pens. They must not be handled any more than necessary, and the water should be clean and uncontaminated. It is best to pump water directly from the ocean through the shrimp tank. If this is not possible, then the water should be changed as frequently as is convenient and should be aerated to keep it well supplied with oxygen.

Strict care should be taken to see that there is no copper or brass anywhere in the tanks or the pipes supplying the salt water to them. This is important since small quantities of copper going into solution with the sea water are sufficient to kill the shrimp. The tanks should be made of some material that will not contaminate the water—wooden or glass tanks are best. Concrete tanks should be coated with asphaltum paint to water proof them. Such tanks should be thoroughly soaked and flushed to make sure that any soluble material in the paint or tank that will contaminate the water is removed. Floating boxes in water where there is a moderate flow are the best.

The temperature is an important factor. In the northern part of Florida where the white shrimp are caught it is best not to allow the temperature to exceed 60° F. The optimum temperature is between 50° and 60° F. Elsewhere where the pinks are caught, particularly in southern Florida, the temperature may be allowed to go as high as 80° F.

Since uneaten food fouls the water, it is advisable not to feed bait shrimp. Some dealers do feed their shrimp, however, using chopped upbarnacles, fish, shrimp, and similar foods.

If no water circulation is used in the tanks, three shrimp per cubic foot may be held for a considerable time. With circulation this figure can be increased to ten shrimp. For short holding periods the number-per-cubic-foot can be increased considerably.

-The Live Bait Shrimp Fishery of the Northeast Coast of Florida, The Marine Laboratory, University of Miami, Coral Gables 34. Fla.



JACKETED-PRINCIPLE COLD-STORAGE ROOM

The keeping qualities of stored frozen fishery products are dependent to a large degree on the atmospheric conditions within the refrigerated storage room. Fluctuating temperatures and low relative humidities in the refrigerated storage room tend to cause excessive dehydration of the products during storage. As a result the

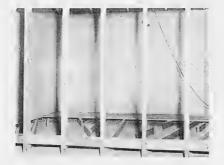


Fig. 1 - Arrangement of air ducts in the floor of the jacketed cold-storage room.

the fish not only lose weight, but also the quality depreciates due to loss of flavor, development of off-odors, and poor appearance. Such loss in weight and quality can "spell the difference between profit and loss" in any marketing transaction.

A refrigerated room designed in a manner so as to maintain ideal product environment offers tremendous possibilities in reducing the product losses which occur as a result of present coldstorage conditions. The jacketed coldstorage room (its use advocated in 1927 by Dr. Huntsman while Director of the Atlantic Fisheries Experimental Station at Halifax, Canada) seems to offer

a combination of ideal product environment and practical engineering design. Some cold storage rooms employing the jacketed principle have been built in Canada; however, the lack of important data on preservation of product quality and cost of operation has made industry somewhat reluctant to accept this design. In order to furnish data on such a method of storage, a cold-storage room employing the jacketed principle was constructed at the U.S. Fish and Wildlife Service laboratory in East Boston, Mass.

In this freezer, cold air circulates through an enclosed space or jacket which completely surrounds the room. The outside surface of the jacket is lined with suitable insulation 10 inches thick. The inside surface of the jacket consists of the materials which comprise the walls, floor, and ceiling of the storage room. Vertical and longitudinal wooden members in the jacket are arranged so as to provide ducts which distribute cold air in the proper amounts through various parts of the jacket. The jacket is a closed-duct system containing a set of finned-pipe cooling coils to maintain the air at the proper temperature and two squirrel-cage fans to provide the necessary air circulation. The cold air circulating through the jacket maintains the inner room at predetermined temperatures of 0° to -25° F.

Some other features of this new cold-storage room are a two-stage Freon 22 refrigeration system, doors in the inner walls of the room which may be opened to enable forced air circulation directly into the room for rapid cooling when initially cooling the room, and dampers to control the air flow in the individual ducts.

Proper air circulation throughout the jacket results in temperature differences as small as 2° F. between the temperature of the jacket walls and the inside room temperature. Owing to this small temperature difference, it is possible to maintain a very high relative humidity within the storage area. Also, the air in the jacket does not enter the refrigerated room; therefore, it cannot draw moisture away from the product. During operation, the moisture contained in the air within the jacket is withdrawn by artificial defrosting. Consequently, the air in the jacket becomes very dry resulting in very little frost accumulation on the cooling coils.

During preliminary tests a room temperature of -23° F, with a maximum variation of only 0.5° F, was obtained by cycling the compressor off a thermostat located in the jacket. Several samples of exposed fish blocks were placed in a conventional-type still-air room at -5° F, and in the jacketed room. Six weeks later the samples stored in the still-air room showed a weight loss of approximately 6 percent, while no appreciable loss in weight occurred in the samples stored in the jacketed room.

More extensive tests will be conducted to determine the effect of storage in this type of room on the storage life of fishery products. Engineering data also will be obtained in regard to the operation of this equipment.



USE OF FISH OILS FOR ORE FLOTATION

During the early 1920's, fish oil was, among other oils, used as a collector in ore flotation. In this process a separation is effected by concentrating low-grade ores with the use of a collector to form a foam which floats the lighter particles such as siliceous material to the top and allows the heavier ore particles to sink to the bottom. Subsequent research by producers of oils of animal or vegetable origin resulted in findings that separated fatty acids or derivatives of fatty acids were more efficient collectors than the oils themselves. With such research lacking for fish oils, such oils dropped out as a source of material for this usage. The quantity of oil derivatives used for this purpose is not large with respect to the weight of the ore, amounting to only about half a pound per ton. In the past, when ore flotation has been used largely as a means of concentration of certain sulfide ores, the potential market of oils for ore flotation has not been very great. Iron ore represents by far the largest tonnage of all ores produced. With the depletion of high-grade iron ores in the United States and the possibility of ore flotation becoming a major method of concentrating low-grade ores, the potential requirement of oil derivatives for this purpose is now far greater than in the past.

Research under the Saltonstall-Kennedy Act has been undertaken at the School of Mines and Metallurgy, University of Minnesota, to investigate the properties of fish-oil derivatives as ore collectors for concentrating low-grade iron ores, sulfide ores, and other ores. Initial work is being concentrated on use for iron-ore flotation.

Preliminary work has developed a procedure for comparing the efficiency of fish oil-derivative collectors with oleic acid as a standard using laboratory and pilot plant-scale techniques. On a theoretical basis, fish oils with longer chain fatty acids combined with a high degree of unsaturation should offer certain advantages over material now used. In initial tests fish-oil fatty acids have been used successfully in experimental tests and have been found to form a foam which is tougher and more tenacious than that produced with oleic acid.

Arrangements have been completed recently for Hormel Institute to assist in this program by preparing certain fractionated fish-oil fatty acids for future testing.

Certain chemically-altered derivatives are also being prepared for use in the program by the U. S. Fish and Wildlife Service's Seattle Fishery Technological Laboratory.



FROZEN BREADED SHRIMP FEDERAL SPECIFICATION

Current Armed Forces and Federal Agencies requirements for frozen breaded shrimp indicated the need for a Federal Specification to facilitate government purchases of the product. Accordingly, a Proposed Federal Specification, PP-S-315 (Shrimp, Breaded, Raw; Frozen), dated February 23, 1956, was prepared by the Quartermaster Corps Food and Container Institute for the Armed Forces and the U. S. Fish and Wildlife Service. This draft has been submitted to the various Federal agencies and to industry for review and comment. It has not yet been approved and is subject to modification pending coordination.



COD-LIVER OIL CONCENTRATE HAS UNIQUE USE

Cod-liver oil concentrate (which is high in natural vitamin A) is superior to synthetic vitamin A in the diet of tuberculous patients, according to a paper ("A Physiologic and Clinical Study of Failures in Vitamin A Metabolism in Tuberculous Patients") by Horace R. Getz which appeared in the <u>American Review of Tuberculosis and Pulmonary Diseases</u>, vol. 72, no. 2.

A summary of the paper indicates that:

"A study was organized to determine if nutritional deficiencies in tuberculous patients could be abolished, and if their removal would lead to improvement in clinical progress.

"Seventy-eight patients with moderately advanced tuberculosis, all of them showing nutritional deficiencies, were placed on bed rest, with a good hospital diet, and subjected to nutritional study and treatment....

"At the start of the investigation, most of the 78 patients were found to have abnormally low blood concentrations of vitamin A and vitamin C. Signs and symptoms of vitamin A deficiency were discovered in patients with normal carotene and vitamin A ester concentrations. This suggested failure of the tissue of these patients to convert carotene to vitamin A and to release vitamin A from vitamin A ester.

"For purposes of the investigation, the 78 patients were divided into three groups: Group I, with no vitamin supplementation of the hospital diet; Group II, which received the same basic diet as group I, plus supplementation with vitamin A in the form of the synthetic substance; and Group III, similar to Group II, which received vitamin A in the form of crude cod-liver oil concentrate instead of synthetic vitamin A.

"The basic hospital diet, more than sufficient for caloric and protein requirements, with more than average amounts of vitamins A and C, did not raise the original low plasma concentrations of tuberculous patients in these two vitamins significantly.

"Therapy with vitamin A produced slow and irregular responses in vitamin A blood concentrations. The response was much better with the cod-liver oil concentrate than with synthetic vitamin A.

"All patients in the group which received the cod-liver oil concentrate (Group III) had a good clinical course and were discharged as inactive cases of pulmonary tuberculosis. There were no clinical failures. In contrast, clinical failures occurred in both the control group and the group which received synthetic vitamin A."



EXPANDING SCHOOL-LUNCH PROGRAM INCREASES POTENTIAL MARKETS FOR FISH

Over 10 million school children eat in school lunchrooms. Eating habits of children throughout the country will be largely influenced by the meals they receive daily in the nationwide school-lunch program. This affords an excellent opportunity for the fishing industry to benefit from this large potential market.

In 12 years, the number of children participating in the national school-lunch program has almost tripled and is increasing at the rate of 8 to 10 percent each year. In 1944, the first year that



A U. S. Fish and Wildlife Service home economist conducting a fish-cookery demonstration at Paris, Ill.

Federal assistance was provided, the program reached about $3\frac{1}{2}$ million children. Since that time, the program has increased year by year to the present total of slightly more than 10 million children. This represents one of the most rapid growing volume markets in the country.

More children will be attending school, more schools will be equipped with lunchroom facilities, and more communities are planning lunch programs as an essential auxiliary food service.

Another measure of program growth is the improved quality of the meals. In 1944 less than one-half of the meals served were Type-A lunches which require milk, 2 ounces of protein, fruit or vegetable, and bread and butter. In 1952, more than two-thirds of the meals served met the Type-A requirement.

As more and better meals are served under the program, schools have purchased correspondingly larger quantities of food from local wholesalers, retailers, and producers. Value of foods purchased locally by schools increased from \$129 million in 1947 to \$250 million in 1952. These local purchases represent over 80 percent of the value of all foods used by the schools.

The United States Fish and Wildlife Service's program of fish-cookery demonstrations reaches over one million of these school children. Anextensive program of fish-cookery demonstrations in cooperation with state school-lunch programs has been in progress for several years. School-lunch managers and cooks attend these demonstrations and learn new and easy methods of preparing fish in the school lunch rooms. Children should be served fish more often as a result of the increased knowledge of the school-lunch cooks, and therefore acquire an appetite for fish dishes, thus increasing the use of fish both at school and in the home.



Additions to U.S. Fleet of Fishing Vessels

FEBRUARY 1956: A total of 26 vessels of 5 net tons and over were issued first documents as fishing craft during February 1956, according to the Bureau of Cus-

toms. This was 2 vessels more than the number reported for the corresponding month of 1955.

U.S. Vessels Issued					
Craft, Februar	y 1956	and (Compa	risons	3
Section					Total
Section	1956		1956		
		(1	Vumbe	r)	
New England	3	5	4	5	18
Middle Atlantic	3	-	5	1	13
Chesapeake	3	5	8	9	54
South Atlantic	6	2	10	6	65
Gulf	7	5	10	8	103
Pacific	2	4	3	6	117
Great Lakes	-	-	-	-	9
Alaska	1	3	2	7	35
Hawaii	1	-	1	-	3
Virgin Islands		-	-	-	1.
Total	26	24	43	42	418
Note: Vessels have b					
sections on the basi	s of r	egiste.	red ho	me po	rts.

The Gulf area led all others during February 1956 with 7 newly-documented craftfollowed by the South Atlantic area with 6; the New England, Middle Atlantic, and Chesapeake areas with 3 each; and the Pacific area with 2. The Alaskan and Hawaiian areas reported 1 each.

Compared with the same month of last year, the New England, Chesapeake, Pacific, and Alaskan areas each had 2 less newly-documented craft added to their respective fishing fleets during February 1956. The Middle Atlantic and Gulf areas had a greater number of fishing vessels documented for the first time during February 1956 than during the corresponding month of 1955.

During the two-month period ending with February 1956, a total of 43 fishing vessels was documented for the first time as compared with 42 for the corresponding period of last year.



Cans--Shipments for Fishery Products, January 1956



Total shipments of metal cans for fish and sea food during January 1956 amounted to 4,402 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 4,743 short tons in January 1955. Fish canning in January 1956 was confined largely to tuna.

Note: Statistics cover all commercial and captive plants known to be producing a metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Federal Purchases of Fishery Products

CANNED FISHERY PRODUCTS PURCHASED THROUGH MARKET CENTERS, 1953-55: Canned tuna, salmon, and some sardines were the principal canned fishery products purchased for the use of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps through its Market Centers. In 1954 canned tuna purchases totaled 3.8 million pounds, but in 1955 they dropped to 2.9

million pounds. Canned salmon purchases climbed from 471,000 pounds in 1954 to 2.8 million pounds in 1955.

Practically all of the canned tuna and salmon purchased by the Defense Department is procured through its Quartermaster Market Centers, but it is believed that only a portion of the requirements for canned sardines are represented in the table since some canned

Purchases of Canned Fi	ishery Products by the
Department of Defense	Through Its Quarter-
master Market C	enters, 1953-55
Canned Product	1955 1954 1953
	(1,000 Pounds)
Tuna	2,906 3,779 1,298
Salmon	2,785 471 766
Sardines	143 450 1,899

sardines and all other canned fishery products are procured locally and no information is available on these local purchases. Therefore, actual purchases of canned fishery products are higher than indicated in the table.

* * * * *

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPART-MENT OF DEFENSE, FEBRUARY 1956: The Army Quartermaster Corps during February 1956 purchased for the use of the Army, Navy, Marine Corps, and Air Force a total of 1.7 million pounds (value \$0.8 million) of fresh and frozen fishery

	s of Fres partmen First Tv	t of D	efense	(Febr	uåry a		53 pe perce Janua
QUA	NTITY			VAI	JUE		pared
February	Jan.	-Feb.	Febr	uary	Jan	Feb.	purch
1956 195	5 1956	1955	1956	1955	1956	1955	about
. (Millions	s of Pou	nds) .	.(Mil	lions	of Doll	ars).	the v
1.7 1.8	3 2.8	3.8	0.8	0.8	1.5	1.6	cent.

products. This was an increase of 53 percent in quantity and about 14 percent in value as compared with January 1956 purchases. Compared with February 1955, the purchases this February declined about 5 percent in quantity, but the value was up about 13 per-

Prices paid for these products by the Department of Defense in February averaged about 51 cents a pound as compared with 68.7 cents in January 1956 and 43 cents a pound in February 1955.

Purchases during the first of two months of 1956 totaled 2.7 million pounds (value \$1.6 million)--lower by 28.5 percent in quantity and 1.1 percent in value as compared with the first two months of 1955.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make some local purchases which are not included in the above figures.



Great Lakes Fishery Investigations

RESEARCH VESSEL "CISCO" OPERATIONS IN 1955: The research vessel Cisco in 1955 completed the hydrographic and fishery study of Lake Michigan started in May 1954. The first two cruises of 1955 in January and March were in the vicinity of Grand Haven and completed operations in the southern half of the lake. The subsequent cruises (III-XI, May-November) covered the northern half of the lake.

A primary objective of the <u>Cisco</u> operation was to study the chubs (<u>Leucichthys</u> sp.) of Lake Michigan, the only commercially important fish remaining in the deeper portion of the lake since the sea

lamprey destroyed the lake trout. Data for comparing the present chub population with that of the early 1930's was available from records of theresearch vessel Fulmar which worked Lake Michigan in 1930-32. Gill nets $(2\frac{3}{8}-, 2\frac{1}{2}-, 2\frac{5}{8}-, 2\frac{3}{4}-,$ and 3-inch stretched measure) made to the same specifications as those used by the Fulmar were fished intensively during Cruise V (July 1955) in the area between Charlevoix and Manistique at depths and stations fished intensively during the same month in 1932. In Cruise VI (August) these nets were fished between Ludington and Manitowoc at depths and stations most heavily fished by the Fulmar in 1930-31.

Preliminary comparisons of the chubs taken in experimental Fulmar-type nets show that the total number of fish is about the same now as it was in the early 1930's. The average length of chubstaken in experimental gangs is about 1½ inches shorter now than in the 1930's. In terms of chubs suitable for commercial use, less than 25 percent of the fish in present catches were over 10 inches long whereas in the 1930's over 60 percent were over 10 inches long.

Increased pressures exerted by the commercial fishery and the sea lamprey are believed to have reduced the average size of the chubs. The commercial catch has increased tenfold from 1940 to 1953. Since small chubs are of little or no market value, the fishermen fish selectively for larger chubs. Sea lampreys, still abundant in Lake Michigan, have only chubs to feed on in their preferred deep-water habitat. They also select the larger chubs. This selectivity has caused the two largest species (Leucichthys nigripinnis and L. johannae) to become extremely scarce.

The smallest chub (L. hoyi), commonly known as the bloater, is avoided by the fishermen and sea lampreys alike because of its size. It was preyed upon to a large extent by the lake trout now absent from the lake. Consequently, the bloater is three times as abundant now as it was in the early 1930's. Other species (L. alpenae, L. zenithicus, L. reighardi, L. kiyi, L. migripinnis, and L. johannae) which were less subject to predation by the lake trout are now used more heavily by the commercial fishery and sea lamprey. They have decreased to about one-third of their former abundance.



Cisco, research vessel of the Service's Great Lakes Fisheries Investigation.

The total weight of chubs taken in Fulmar-type nets was 20 percent less in 1954-55 than in 1930-32. Although these nets did not sample the smallest fish, which may be more abundant now than before, it appears that the lake may be supporting fewer pounds of chubs now than it did in the 1930's. Chubs of the same length weigh more now than they did in the 1930's, which indicates that presently there is probably more food available per pound of fish.

Materials were also collected for a complete study of the distribution and biology of the present chub populations and to establish a base abundance index that can be used for future reference. Experimental gangs of nylon gill nets with mesh sizes ranging from 2 to 4 inches were set at depths between 25 and 135 fathoms at representative locations in northern Lake Michigan. Otter-trawling collected chubs both on the bottom and at middepths. Vertical distribution of chubs was determined by sitting 1- and 2-inch mesh gill nets obliquely from

the surface to the bottom. This life history material will be used to evaluate further changes in the chub population that have resulted from the sea lamprey's upset of the biologic community and the increased selective commercial fishing effort for chubs.

Although the collection of chubs was the primary objective of most fishing operations, much information was obtained on other species in the lake. Many records were made of the occurrence of the alewife (Pomolobus pseudo-harengus), a new species just establishing itself in Lake Michigan. Yellow perch (Perca flavescens) were taken in abundance from shallow areas and provided an abundance of material for biological studies.

Young fish in the larval and fry stages collected in plankton nets will provide valuable information on the early life stages of chubs and other species.

A sensitive recording fathometer operated continuously while the <u>Cisco</u> was on the lake. Characteristics of bathypelagic records on the fathometer were studied intensively and explored with special trawling and plankton sampling to identify the midwater sound scatterers. Special observations were made of the fathometer responses for different types of bottom formations characteristic of the Great Lakes, and for the presence of fish on and above the bottom.

Hydrographic transects were made across the lake between Ludington and Manitowoc, Frankfort and Sturgeon Bay, Charlevoix and Manistique, and Manistique and Frankfort. Surface water temperature was recorded by a thermograph all of the time the boat was on the lake. On all transects, a bathythermograph cast was made at 5-mile intervals. On the first three transects surface water samples were collected and 20 drift bottles (10 weighted with sand and 10 with metal drags suspended from them) were released at the time of each bathythermograph cast. Also, on the first three transects one station was occupied near each shore and one near the center of the lake where water samples and reversing thermometer temperatures were taken from the surface to the bottom, and a plankton tow was made at 5 meters below the surface. At various times during the year, plankton tows and hydrographic observations were made off Frankfort at various depths over continuous periods ranging from daylight into darkness.

Temperature data is now undergoing careful analysis to determine the general thermal characteristics of the lake and some of the water movements that are reflected in the thermal structure. In general, there is a well-defined thermocline in Lake Michigan from late May until mid-December. Although the depth and thickness of the thermocline can vary greatly at different locations at any one time, its mean depth increases from spring until fall and its thickness tends to reach a minimum during the warmest months. The thermocline is disrupted occasionally by local upwellings, the extent and duration of which depend on the intensity and persistence of conditions (generally winds) that caused them. The thermal structure of Lake Michigan is not as regular as that commonly found in inland lakes. Thermal irregularities are due mainly to water movements that are organized primarily in relation to climatic forces and to the configuration of the basin. Although the lake basin is large compared with most fresh-water lakes, its confinement and irregular configuration seem to minimize the effects of the geophysical forces that are so active in regulating water movements in the ocean.

Nearly 60 percent of the 4,000 drift bottles released during the year had been returned by the end of the year. One objective of the study was to elearn which of two methods was best for weighting the bottles. One series of bottles was weighted with sand so that about $\frac{1}{2}$ inch of the bottle was exposed above the water. Another series was weighted similarly with a metal drag attached to the bottle with a wire. Initial observations showed that the bottles weighted with sand washed up on the beach more quickly than those with drags after reaching shore but that their movements were influenced more by the wind because the drags gave added resistance to wind-induced movements.

Reply cards enclosed in the drift bottles asked the finder if a drag was attached to the bottle when it was found. In the first releases, over 50 percent of the bottles had lost their drags before they were found and remarks of the finders indicated that the drags were lost because the wire was broken at the neck of the bottle.

Loss of drags was greatly reduced by introducing a brass ring in the connection at the neck of the bottle to allow the bottle to move freely without bending the wire. The resistance of bottles with drags to being washed up on the beach was eliminated by shortening the wire between the drag and the bottle from 3 feet to 1 foot. With the short

wire both drag and bottle are in the surf when the bottle reaches shore and are washed onto the beach simultaneously. Comparisons between movements of bottles in the lake and observations of dye patches released at 1 and 3 feet below the surface showed that the movement of the bottles would not be changed by the shallower drag attachment.

The bottle with drag suspended by a one-foot wire having a flexible brass ring attachment at the neck of the bottle has been adopted as the most suitable drift element for water movement studies of the Great Lakes. It has no disadvantages over the bottles weighted with sand and has the advantage of being less influenced by direct action of the wind,

Analysis of water collected in 1955 is incomplete but continues to show that the water of Lake Michigan is relatively uniform throughout but has a somewhat greater concentration of chemical constituents near shore.

Special attention has been given to a study of the life history, distribution, and movements of Mysis relicta and Pontoporiea hoyi, two of the more important fish-food organisms in Lake Michigan.

Mysis was successfully established in a laboratory culture and a study of its life cycle is being continued.

Analysis of zooplankton collected at various depths during daylight and dark is being made to show the distribution of various plankters and what diurnal movements, if any, occur. Extensive collections of bottom organisms have been made but are not yet undergoing analysis.

--Stanford H. Smith, Fishery Research Biologist, Great Lakes Fishery Investigations, Ann Arbor, Mich.

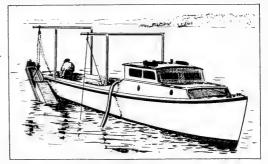


Maryland

NEW CLAM RESEARCH VESSEL OUTFITTED: A hydraulic clam research vessel, the John A. Ryder was recently acquired by Maryland, according to the Febru-

ary 1956 Maryland Tidewater
News of the Maryland Department of Research and Education.

The vessel is fully equipped for experimental dredging of soft-shell clams. With a length of 42 feet over-all and a registered tonnage of 8, the boat has dredging equipment, and a motor-driven centrifugal pump of sixinch intake supplies hydraulic power. Living quarters for two are provided in the trunk cabin. Adequate stowage is available for diving gear, photoelectric instruments, and other equipment used in the clam research program.

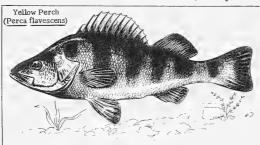


Hydraulic clam research vessel John A. Ryder.

Noteworthy is the fact that the John A. Ryder and the entire complement of dredging and research equipment has been purchased from the Clam Fund, which was earmarked by the 1955 Maryland Legislature for the purpose of clam research, and supported solely through a bushel tax on Maryland's production of soft-shell clams. The boat has been named for a pioneer shellfish biologist who, during the period 1881-1885, made what are believed to be the first published observations on the biology of the soft-shell clam in the Chesapeake area. Note: Also Commercial Fisheries Review, March 1956, p. 19.

YELLOW PERCH SPAWNING SURVEY: A survey of spawning areas of yellow perch are being carried out this spring by Maryland's Chesapeake Biological Laboratory as part of a study of the life history of this species in Tidewater Maryland.

Since the exploration by one or two biologists of the many miles of tributary streams would be a monumental task, Maryland Tidewater Fisheries officers, Game



and Inland Fish wardens, and the general public are all being asked to cooperate by reporting any evidence of yellow perch spawning in their areas. During late February and early March yellow perch move into upstream areas and spawn over a two- to threeweek period. The eggs are extruded in long amber strings which catch on brush and other underwater obstructions. These egg strings may be up to several feet in length and take the form of a hollow tube 2 to 4 inches in

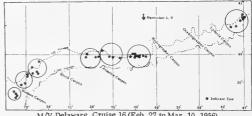
diameter with the walls pleated like accordion bellows. These eggs will hatch in approximately three weeks depending on water temperatures.

Readers who observe these eggs should send a post card to the Maryland Tidewater News, giving: (1) the date and (2) the exact locations where yellow percheggs were observed. Information supplied by the public will be followed up by a field biologist, the February 1956 issue of that publication points out.

North Atlantic Fisheries Exploration and Gear Research

NEW RECORD CATCHES OF DEEP-WATER LOBSTERS REPORTED BY "DEL-AWARE" (Cruise 16): New record catches of deep-water lobsters were established during Cruise 16 of the Delaware, which was completed with return of the vessel to

East Boston on March 9, 1956. On three consecutive tows, numbers 36, 37, and 38, a total of 3,290 pounds of deep-water lobsters was landed. The new individual tow record is number 38, of one hour's duration, with a catch of 177 lobsters averaging 7 pounds each -- a total of 1, 239 pounds. These tows were made in Area "F" (see chart).



M/V Delaware, Cruise 16 (Feb. 27 to Mar. 10, 1956).

This cruise was one of a series designed to explore the offshore deep-water areas for commercial concentrations of the lobster (<u>Homarus americanus</u>). Gear used was a standard No. 41 otter trawl. Exploration was conducted in six areas, in the 100- to 400-fathom depth range along the edge of the continental shelf, from the vicinity of Hudson Canyon, eastward to the vicinity of Lydonia Canyon. A total of 38 tows was made. In general, catches were small in Areas "A" through "E" but large in Area "F."

Offshore tagging of lobster was continued--105 were tagged and released where caught, and 200 lobsters were turned over to the Commonwealth of Massachusetts and the State of Rhode Island for tagging and release off Scituate, Plymouth, and Narragansett Bay. Among these were 92 large egg-bearing females.

No significant catches of other fish were made.

The <u>Delaware</u> will continue deep-water explorations at the edge of the continental shelf from Hudson Canyon southward on March 19, when the vessel's departure for Cruise 17 was scheduled.

14

North Atlantic Fishery Investigations

DISTRIBUTION OF HADDOCK EGGS AND LARVAE ("ALBATROSS III," Cruise 71): To determine the distribution of haddock eggs and larvae, temperature and

salinity, and the general circulation pattern in the Gulf of Maine and Georges Bank area was the purpose of Cruise 71 of the Service's research vessel Albatross III. The vessel left its home port of Woods Hole, Mass. February 20 and returned on March 2.

Operations were conducted on Georges Bank and Browns Bank, and in the Gulf of Maine. Approximately 2,000 miles of continuous plankton tows were made at the surface and 10 meters with Hardy Plankton Recorders. A total of 183 bathythermograph lowerings, 100 salinity samples, and 12 surface tows with the standard meter net were made: and 5 samples of eggs were hatched out for identification purposes. A total of 720 drift bottles were released throughout the area.

Haddock, cod and plaice eggs; herring, cod, and blenny larvae were found. Haddock eggs were found only on Northern Edge of Georges Bank along with cod. Only 2 eggs were found on Browns Bank and these were cod.



Plankton nets are used to capture samples of eggs and larvae,

North Carolina

FISHERY TRENDS, 1955: In North Carolina during 1955 landings of shrimp, menhaden, hard crabs, and bay scallops increased but those of food fish, soft crabs, hard clams, and oysters dropped as compared with 1954. The table is a summary of the North Carolina landings of fish and shellfish for 1954 and 1955 as reported by

Species	1955	1954
Shellfish:		
Oysters (bu., state)	111,520	126,782
Shrimp (lbs., heads off).	5,777,300	5,202,049
Clams (bu., U.S.)	6,653	48,332
Crabs, soft (doz.)	6,402	37,971
Crabs, hard (bbls.)	76, 299	43,646
Bay scallops (gal.)	7,536	5,315
Finfish:		
Food fish (lbs.)	27, 472, 138	32,003,874
Menhaden (lbs.)	178,602,600	136,007,500

the North Carolina Department of Conservation and Development.

Shellfish: The shrimp fishing season in North Carolina waters opened on May 11, 1955. The total catch increased over that for 1954 and a better price prevailed during the early months of the season. During August 1955

a very severe hurricane completely disrupted fishing activity for two full weeks, and in September two more hurricanes completely demolished several fish houses along the coast and damaged many others. All three storms occurred at the height of the shrimp fishing season and the catch was greatly curtailed. Prices on the whole averaged better than for the 1954 season.

The catch of hard crabs was good in 1955 and the ex-vessel prices in the spring were the highest on record. For the early spring season the price varied from 10 to 12 cents a pound, with some bringing as high as 14 cents a pound ex-vessel. The increase in price over former years was due to a severe shortage of crabs in the

Hampton-Newport News area of Virginia. The Virginia market normally controls prices in North Carolina.

The soft crab production declined drastically due largely to the good market for hard crabs. During the soft crab season the price of hard crabs was at its peak. Therefore, most of the fishermen turned their attention to that fishery. Production in 1955 was only about one-sixth of that for the year 1954.

The hard clam fishery was depressed during 1955. The severe hurricanes of the past two years apparently had an adverse effect on the production.



Live crabs ready for steamer.

Oyster production dropped from 126,782 tubs in 1954 to 111,500 tubs in 1955. It is felt that most of this loss should be attributed to the three hurricanes of 1955.

The catch of bay scallops was fair. Approximately one-third more bay scallops were produced in 1955 than in 1954, and ex-vessel prices ranged from \$4.00 to \$4.50 a gallon ex-vessel.

Finfish: The alewife season in the Albemarle County area was very good from the catch standpoint. However, the price dropped from \$15.00 a thousand fish in

March to \$2.00 a thousand in April. Finally there was no market at all except for the fish-meal processing plants. This fishery was depressed due to poor demand and unless some new ways are found to process and market the fish, future marketing prospects are poor.

The year 1955 showed the highest menhaden catch since 1949. In November the fish were large with heavy oil content, but in December the fish were very small with a low oil content.

The production of other food fish was less, on the whole, than it was in 1954. Again, as in former recent years, it would seem that this was due to some extent to the fact that many fishermen turned to the more profitable shrimp fishery. The fall spot season was very poor as compared to former years, but the quality was better than for any other year in history. The mullet catch was not high as compared to other years. These last two species were no doubt affected greatly by the three disastrous hurricanes which hit in the middle of the season.



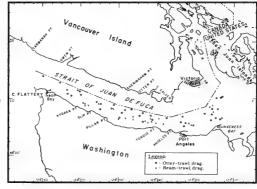
North Pacific Exploratory Fishery Program

BOTTOM FISH EXPLORATION IN STRAIT OF JUAN DE FUCA BY "JOHN N. COBB" (Cruise 25): To determine the trawlability of the bottom and the species and quantities of bottom fish available to commercial fishing methods at this season were the chief objectives of Cruise 25 (February 15-March 9) of the Service's exploratory fishing vessel John N.

Cobb.

Commercial species of bottom fish were found to be at a low level of abundance in the Strait of Juan De Fuca at this season of the year, according to results of this 24-day exploration. The vessel completed a total of 61 drags on the United States side of the Strait.

A total of 38 otter-trawl drags and 23 beam-trawl drags were made at depths from 44 to 149 fathoms between Cape Flattery and Dungeness Spit. Rough bottom caused considerable gear damage, as was expected, but a number of places were found



M/V John N. Cobb, Cruise 25 (February-March 1956).

with suitable trawling bottom which may be more productive at other seasons.

Most of the otter-trawl catches were predominantly scrap fish (dogfish, ratfish, skrtes, and turbot), totaling several thousand pounds in some drags. The largest catch was 4,500 pounds an hour. Up to 350 pounds of large ling cod and 400 pounds of true cod were taken with the otter trawl. Small numbers of rockfish, petrale sole, English sole, Dover sole, and pollock were present in the catches.

Three species of commercial shrimp--pink (Pandalus borealis), side stripe (Pandalopsis dispar), and spot (Pandalus platyceros)--were taken in the beam trawl in very small quantities. Catches ranged from 1 to 31 pounds per 1-hour drag. Stomach analysis showed that the true cod were feeding heavily on pink shrimp.

Although shrimp were found to be present over the entire area covered, no apparent concentrations were found.



North Pacific Oceanographic Survey

JACK MACKEREL RANGE EXTENDED: In August 1955 oceanographic research vessels from the west coast of the United States and Canada, the Hawaiian Islands, and Japan participated in a coordinated collecting expedition over the northern Pacific Ocean (NORPAC). While some time may elapse before data collected on this expedition are completely analyzed, some interesting results are available, according to the U.S. Fish and Wildlife Service Branch of Fishery Biology.

Fish and Wildlife Service biologists state that as a result of the NORPAC expedition knowledge of the range of jack mackerel has been greatly extended. This fish is of considerable commercial importance in California. Eggs and larvae collected on this expedition indicate the species spawns as far seaward as 1,200 miles off the Oregon coast. Prior to this expedition, eggs and larvae had been routinely collected 200 to 300 miles off the California coast and on occasion about 450 miles west southwest of Point Conception, Calif. The offshore extent of routine collections and not the distribution of fish determined these distances. Since eggs and larvae had been taken at almost all of the westernmost collecting stations during the spawning season, it was obvious that the spawning area in the past extended beyond these limits. Small numbers of eggs and larvae were collected also a little farther north than in previous years.

During this expedition the Service's exploratory fishing vessel John N. Cobb obtained a similar range extension for adults. Previously known from as far north as the Queen Charlotte Islands in British Columbia, adults were taken on this expedition in the Gulf of Alaska, which is some 200 miles farther north. They extended about 500 miles to the west, almost to Kodiak Island. The westernmost adults in the Gulf were about 700 miles directly north of the eggs and larvae collected 1,200 miles west of Oregon. This extended adult distribution agrees with the spawning range extension revealed by the egg and larvae distribution.

When attempting to explain the mechanisms responsible for fluctuations in the catch of species, such as the jack mackerel, it is essential to know the full extent of its spawning range, as well as its entire range. In considering the area that must be explored to accomplish this, cooperative cruises like NORPAC are the most practicable solution. The extensive data collected in this fashion augment the knowledge of several agencies, each of which may be investigating some particular biological or physical aspect of the ocean. The advent of NORPAC indicates a trend toward such cooperative surveys.



Oysters

<u>CANNED OYSTERS INDUSTRY STANDARDS</u>: Oyster canners of the Gulf and Atlantic Coast areas met in New Orleans February 28 and adopted industry standards for canned oysters. The definitions adopted by formal resolution of all of the 28 canners represented at the meeting were:

(1) <u>Definition</u> - <u>Whole Oysters</u>: For purposes of classifying canned oysters for grading, a whole oyster shall be defined as: "Any oyster consisting of a stomach section, a portion of the eye, or adductor muscle, and a major portion of the mantle." Some mutilation and cutting shall not be considered as a bar to classification as a whole oyster.

(2) <u>Tolerance</u>: The term "Oysters" shall be used to describe the canned product when it contains oysters, as defined, and not more than 15 percent broken oysters (pieces of oysters) by weight.

(3) <u>Definition</u> - <u>Broken</u> <u>Oysters</u>: The term "Broken Oysters" shall be used to describe the canned product when it consists of broken oysters or a mixture of broken and tiny oysters.

The canners also voted that February 28, 1956, be the date for adoption of these standards; that a copy of the resolutions be sent to the Food & Drug Administration, Department of Health, Education and Welfare, Washington, D. C., and New Orleans, La.; that wide and thorough publicity be given to these standards.

In addition, the group voted that on or about June 1, 1957, a new industry-wide meeting of the oyster packers shall be called to consider the revision of present temporary oyster standards and for the adoption of permanent standards for oysters as based on additional experience gained during the coming two oyster packing seasons.



Packing oysters.



Public Eating Places Survey

REASONS FOR NOT SERVING FISH OR SHELLFISH: The preliminary results of a U. S. Fish and Wildlife Service sample survey showed that of the 23,000 out of 150,000 restaurants and cafeterias which did not serve fish or shellfish meals, almost half said there just wasn't "sufficient demand." Some 20 percent of the restaurants and cafeterias in the "no-fish" group said they served a "specialty of the house"--obviously not fish or shellfish. Another 10 percent didn't have suffi-

Table 1 - Reasons Given by Pul	olic Eatin	g Place	s for No	t Servi	ng Fi	sh or S	hellfish	by Typ	e of Est	ablishr	nent, 195	5
Reason For Not Serving Fish or Shellfish	Tota	ls	Restau	rants	Cafe	terias	Restau or Cafe in Ho	eterias	Drug Propri Store	etary	Othe	
No storage space Insufficient demand Sell only specialty Too much work involved Can't get fish in form wanted No food or meals served Don't know how to cook and serve Too costly to serve Strong odor Difficult to handle Fish doesn't keep Other reasons No answer	No. 13,309 46,196 61,676 4,613 596 51,791 223 3,409 898 1,422 671 3,871 1,041	%7.0 24.4 32.5 2.4 0.3 27.3 0.1 1.8 0.5 0.7 0.4 2.0	10, 366 4, 421 819 521 75 967 75 391 298 671 223	% 10.3 49.4 21.1 3.9 2.5 - 0.4 4.6 0.4 1.8 1.4 3.2 1.0	No. 150 148 299 75	22.3 22.1 44.5 11.1	No. 64 532 104 - 79 - 446	5.2 43.4 8.5 - - 6.5	No. 1,746 2,244 10,030 298 10,672 223 223 223 669	% 6.6 8.6 38.2 1.2 - 40.5 0.8 0.8	No. 9, 192 32, 906 46, 822 3, 421 75 41, 119 148 2, 219 521 1, 031 150 2, 085 818	%_6.5 23.4 33.3 2.4 0.1 29.3 0.1 1.6 0.4 0.7 0.1 1.5 0.6
Total serving no fish or shellfish . 1/ Includes drinking places, lunch counters, and refres	189,716	100.0	20,984	100.0	672	100.0	1,225	100.0	26,328	100.0	140,507	100.0

cient storage space. Less than 5 percent pointed out the difficulty of handling or cooking, keeping quality, or odor; and only 10 percent indicated "too costly" or "involved too much work."

Of approximately 35,000 drug and proprietary stores with fountain service, the survey indicated about 16,000 or 46 percent of them constitute a potential market for increasing consumption of fish and shellfish since they reported serving food other than fishery products. Of these 16,000 establishments, 64 percent indicated

"serve only specialty of the house" and 14 percent reported "insufficient demand" by the public as reasons for not serving fish meals. The more important reasons given by establishments classified as "other," consisting of drinking places, lunch counters, and refreshment stands, were "no meals served," "sold only specialty of the house," or "insufficient demand," in the order listed.

Regionally there are striking differences in the reasons for not serving fish and shellfish. Despite the closeness of establishments in the Northeast region to the source of fresh fish supply, over 40 percent of the public eating places in the region gave "insufficient demand" as the reason for not serving fish and shellfish meals in contrast to 20 percent of the establishments in the North Central, South, or West. The difference is primarily due to the high proportion (50 percent) of drinking places, lunch counters, and refreshment stands in the Northeast region, which are more likely not to serve fish in the first place.

When the establishments which do not sell fish or shellfish meals are classified according to the annual dollar volume of business, "sell only specialty" was an important reason (averaging about 35 percent) common to all. In category of eating places with sales of \$100,000 or more, only 10 percent said "insufficient demand" was the reason for not serving fish and shellfish. In establishments whose sales volume was under \$100,000, about one-third said "insufficient" was why they didn't serve fishery products.

Final results of the survey, which is being financed by funds provided by the Saltonstall-Kennedy Act of 1954, are scheduled for publication later this year. The U.S. Fish and Wildlife Service contracted with the Bureau of the Census to conduct the survey.

This study on reasons for not serving fish and shellfish in eating establishments is one part of a broader study of fish and shellfish consumption characteristics in public eating places. The findings are based on a nationwide scientific sample survey of approximately 4,500 establishments during the month of May 1955. The results were projected for the number of public eating places known to be operating in the United States.



Rhode Island

			1954	
Principal Species	Qua	ntity		lue
	1955	1954	1955	1954
Fish:	.(1,000	Lbs.).	. (\$1,	000).
Butterfish	2,126	1,396	189	143
Cod	799	1.071		
Flounders:		.,		-
Gray sole	61	132	5	13
Lemon sole	21	26	4	- 1
Yellowtail	1,448	1,681		153
Blackback	1,454	1,282		10
Dab	232	253		24
Fluke	2,152	2,374	420	384
Other	8	4		1
Haddock	320			
Herring, sea	663			
Menhaden	14,341	17,945		
Scup	5,903	5,715		
Sea base	437			
Filefish	1,181			
Whiting	3,257	2,793	72	61
Other fish: .				
For food	632	993	65	
For reduction	73,401	58,901	626	509
Total Fish	108,436	97,355	2,325	2, 20
Shellfish:				
Lobsters	. 284		129	111
Clams, hard, public beds	4,949	4,495	1,913	1.70
Scallops, bay	133	32		
868	219	62		
Other shellfish	831			
Total Shellfish	6,416		2,330	
Grand Total		103,061		

FISHERY LANDINGS, 1955: Landings of fishery products in Rhode Island during 1955 amounted to almost 115 million pounds, valued at over \$4.6 million ex-vessel. This was an increase of nearly 12 million pounds (11.4 percent) in quantity and \$530,000 (12.8 percent) in value over 1954. Fish (including menhaden) for reduction and other industrial purposes (87.7 million pounds) was the leading item based on quantity and comprised 76.4 percent of the total landings in 1955. Hard clams, the most valuable single product landed in 1954 (ex-vessel value, \$1.9 million) made up 41 percent of the total ex-vessel value.

The month of May in 1955 led all other months in landings with nearly 19.7 million pounds, followed by June (15.0 million pounds), and September (15.3 million pounds).

Although the 1955/56 crop of Narragansett Bay oysters is about exhausted, future prospects for the

oyster industry in Rhode Island are brighter than they have been for several years. The current shortage of 4- and 5-year old oysters in Narragansett Bay is largely due to damage done by hurricanes which had wreaked havoc in the leased oyster beds of the bay and in the Warren River. More damaging than any of the hurricanes was a heavy windstorm that swept across Long Island Sound in November 1950, destroying about 80 percent of the seed oysters. The 1950 loss has been felt continuously since then although there is now some optimism about the future of the industry on reports of a good 1955 "set" of seed oysters in and around Norwalk and Bridgeport, Conn.



Salmon

FIRST KNOWN ATTACK BY LAMPREY: The first known attack by a Pacific species of young lamprey on a coho salmon fingerling has been reported to the Fisheries Research Board of Canada Biological Station at Nanaimo, the Canadian Trade News (January 1956) announces.

The fingerling, about 3.5 inches long, was picked up in the Skeena River with a 6.4-inch lamprey firmly attached to it. When the lamprey was removed, a deep flesh wound was revealed.

The young coho was assumed to be on its seaward migration. Examination of the lamprey by Dr. V. D. Vladykov, of the Quebec Department of Game and Fisheries, showed it was a fresh-water species and predaceous on fishes.

This species of lamprey has been reported in British Columbia from Cultus Lake, Fraser River, and Cowichan River.



South Atlantic Exploratory Fishery Program

DEEP-WATER RED SHRIMP CAUGHT IN SOUTH ATLANTIC BY "PELICAN" (Cruise 1): The first deep-water red shrimp taken by a vessel fishing in the Atlan-

tic off the southeastern United States were brought in to Jacksonville, Fla., by the <u>Pelican</u> on March 9th. The <u>Pelican</u> is under charter by the U. S. Fish and Wildlife Service and is carrying on a deep-water shrimp exploration program with funds provided by the Saltonstall-Kennedy Act of 1954.

The <u>Pelican's</u> first exploratory cruise started March 1, but weather permitted only two days of trawling at depths of 1,000 to 1,500 feet off Fort Pierce and Daytona Beach, Fla. Deep-water red shrimp were taken in 8 out of the 9 drags made in this area with exploratory nets. The <u>Pelican</u> will continue fishing with



Cruise 1 of the Service's exploratory fishing vessel, the Pelican.

the larger 100-foot commercial nets for the remainder of the month in this general area to determine if the small catches already made can be increased.

Although the deep-water red shrimp are not yet being fished commercially, evidence that they form an unutilized resource of considerable magnitude in the Gulf of Mexico has been shown by explorations of the U. S. Fish and Wildlife exploratory fishing vessel <u>Oregon</u>. Their presence off the Atlantic coast is of special interest to the fishing industry because they may be sought by specially-rigged shrimp vessels during the season when shrimp are not available in inshore waters.



U.S. Foreign Trade

FISH-OIL EXPORTS IN 1955 AGAIN AT RECORD HIGH: Fish-oil exports from the United States reached a record 71,316 short tons in 1955, an increase of about 1 percent from the previous high of 70,817 tons in 1954. Western Europe was again the largest importer of United States fish oils, although the exports to that continent were down approximately 5 percent from 1954. This decrease was due to the almost 8-percent drop in exports to the Netherlands. In contrast, exports to Canada were up about 50 percent from the previous year, states the March 5 issue of Foreign Crops and Markets of the Department of Agriculture.

U.S. Fish-Oil Exports by Country of Destination, Average 1935-39, Annual 1952-55									
Country of Destination	$1955^{\frac{1}{2}}$	$1954\frac{1/2}{2}$	1953	1952	Average 1935-39				
NORTH AMERICA:	(Short Tons)								
Canada	11,251	7,511	2,108						
Cuba	83	126	87	100					
Mexico	81	118	114	122	45				
Other	11 110		1	3	71				
Total	11,416	7,755	2,310	713	729				
SOUTH AMERICA:	56	148	63	38	96				
EUROPE:									
Belgium-Luxembourg	1,098	-	764	8	8				
France	9	-	7	149	19				
Western Germany	10,503	10,481	36,155	6,232	126				
Italy	106	85	28	220	15				
Netherlands	40,260	43,692	8,913	11,967					
Norway	6,140	1,102	1,606	-	10				
Switzerland	646	5,797	3, 115	3,140	15				
United Kingdom	881	1,376	299		77				
Other	23	27	23	43	15				
Total	5 9,666	62,560	50,910	21,759	300				
ASIA:									
Philippines, Republic of	-	233	860	546	66				
Other	55	51	37	20	24				
Total	55	284	897	566	90				
OTHER	68	70	53	3					
Grand Total	71,336	70,817	54,233	23,079	1,234				
<u>1</u> / Preliminary <u>2</u> / Revised									

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SHRIMP IMPORTS, 1955: United States imports of all shrimp (fresh, frozen, canned, and dried) from all countries in 1955 reached the record total of 54.2 mil-

lion pounds as compared with 41.5 million pounds for the same period in 1954. United States shrimp imports from Mexico for 1955 totaled 45.8 million pounds as compared with 34.9 million pounds for the same period in 1954.

Mexico again was the principal supplier of shrimp to the United States. In 1955 there was a considerable increase in shrimp imports from Mexico principally because towards the latter part of the year landings on Mexico's west coast were excellent and showed a reversal of the downward trend which had been reported the past few years.



Shrimp boats waiting for unloading or re-icing,

More and more countries are seeking to increase their shipments of frozen shrimp to the United States. Panama, the second most important supplier, increased its exports to the United States in 1955. Norway, Costa Rica, Japan, and Ecuador also stepped up their shrimp exports to the United States.

United States, Shrimp Imports (Fresh, Frozen, Canned, and Dried), 1954-55									
Country of Origin	1955	1954	Country of Origin	1955	1954				
	(1,000 Lbs.)			. (1,000 Lbs.).					
Mexico by			Peru	385	446				
Customs Districts:			Iceland	49	26				
New Orleans	2,683	1,317	Sweden	2	5				
Galveston		5	India	127	112				
Laredo	13,855	12,049	British Honduras	-	2				
El Paso	20	119	Argentina	-	528				
Arizona	28,388	19,834	Spain	-	52				
San Diego	612		Korea		15				
Los Angeles	194		Netherlands	-	23				
San Francisco	36		Turkey	10	30				
Washington	-	81	West Germany	7	3				
Puerto Rico	25		Nicaragua	8	1				
Mexico Total	45,813	34,888		6	-				
Panama	4,224	3,663	Bahamas	30	-				
Canal Zone	40	-	Pakistan	4	-				
Norway	222		Surinam	3	-				
Costa Rica	141	43	United Kingdom	1	-				
Hong Kong	29	-	Australia	20	-				
Japan	906	439	British Guiana	1	-				
Canada	102	58	Italy	-	2				
Cuba	70	113	Egypt	-	2				
Colombia	364	391	Chile	1	-				
Ecuador	1,603	548	Chile Grand Total	54, 168	41,543				
(Continued in opposite	1/ Mostly frozen.								

Note: Also see Commercial Fisheries Review, April 1955, p. 50,

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GROUNDFISH FILLET IMPORTS UP IN FEBRUARY 1956: Imports of ground-fish (including ocean perch) fillets during February 1956 totaled 11.0 million pounds compared with 8.5 million pounds imported during February of last year, according to the U. S. Fish and Wildlife Service. This represents an increase of 29 percent. The gain was primarily due to a 2.5 million-pound increase in the imports of fillets from Canada. Denmark and the Netherlands also exported more ground-fish fillets to this country during February 1956 than during the corresponding month of last year. Imports of Icelandic groundfish fillets during February of the current year (809 thousand pounds) were 20 percent below the 1.0 million pounds reported for the same month of 1955. Imports of fillets from Norway, the United Kingdom, and West Germany were also lower.

Canada continued to lead all other countries exporting groundfish and ocean perch fillets to the United States with 9.4 million pounds during February 1956--85 percent of the total groundfish fillet imports during the month.

Total groundfish and ocean perch fillet imports into the United States during the first two months of 1956 amounted to 26.5 million pounds compared with 21.5 million pounds during the same period of 1955. Canada, with 19.2 million pounds, led all other countries exporting fillets to this country during the above period, followed by Iceland (5.1 million pounds), and Norway (1.2 million pounds).



Washington

<u>PACIFIC</u> <u>HERRING MIGRATIONS</u>: Further evidence of the migration of herring between the State of Washington and British Columbia feeding and spawning grounds has been obtained by the Washington State Department of Fisheries from herring tagged in 1955 among the San Juan Islands and at Holmes Harbor on Whidbey Island.

A total of 33 metallic tags inserted in the body cavity of herring caught and released in 1955 have been picked up by magnetic detectors sampling British Columbia catches from the lower east coast of Vancouver Island since November 1955.

Twelve tags were from a group of 8,000 herring released between Orcas and Lopez Islands in the fall of 1955, and nine from another lot of 153 tagged November 7, 1955, off the west coast of San Juan Island.

Eleven fish of 5,000 tagged in Holmes Harbor in April, 1955, also were captured in the Canadian fishery. One showed up from 1,000 herring released March 1955 in Agate Pass, near Bremerton, Wash. The recoveries came from the general vicinity of Active Pass, about 10 miles north of Sidney, B.C.

The tagging project is part of an investigation started three years ago on Puget Sound to determine migration, spawning, and feeding habits, and in particular to define the amount of back-and-forth movement between Canadian and United States stocks of herring.



Wholesale Prices, March 1956

Changes in the over-all index for all edible fish and shellfish (fresh, frozen, and canned) between February and March 1956 were slight (113.7 percent compared with 113.1 percent of the 1947-49 average). The index for March 1956 was lower by less than one percent when compared with February 1956, but higher by 12.3 percent than for March 1955.

The very slight increase of 0.4 percent from February to March in the drawn, dressed, or whole finfish subgroup index was due to higher prices for fresh white-

fish and lake trout plus a slight increase for frozen halibut. These increases were largely offset by decreases in the ex-vessel price for large haddock at Boston (index down 9.7 percent from February) and lower prices for yellow pike at New York. Compared with March 1955, the subgroup index for March 1956 was higher by about 19 percent due to a better market for all the subgroup items except yellow pike which was down 24 percent.

The fresh processed fish and shell-fish subgroup index shows a decline of only 0.9 percent from February to March 1956. The decline was due to lower prices at Boston for fresh small haddock fillets (index lower by 7.7 percent) and a very



Baked shad

Group, Subgroup, and Item Specification	Point of Pricing	Unit		Prices1/			Indexes (1947-49=100)	
			Mar. 1956	Feb. 1955	Mar. 1956	Feb. 1955	Jan. 1955	Mar 195
FISH & SHELLFISH (Fresh, Frozen, & Canned)	1	١	1		113.1	113,7	122.3	100
Fresh & Frozen Fishery Products:					120,6	2/121,7	136.5	10
Drawn, Dressed, or Whole Finfish:					114.6	114.1	143.5	9
Haddock, Ige., offshore, drawn, fresh	Boston	1b.	.08	.09	78.5	86.9	208,2	6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.32	.32	98.0	97.5	89.2	7
Salmon, king, Ige, & med., drsd., fresh or froz.	New York	1b.	.61	.60	137,6	134,3	135,4	11
Whitefish, L. Superior, drawn, fresh	Chicago	1b.	.82	.73	204.5	181.0	2471.0	16
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.80	-	161.8	131.4	141.5	13
Lake trout, domestic, No. 1, drawn, fresh.	Chicago	1b.	.82	.74	168.0	150.6	131.1	13
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	1b.	.52		123.1	129.0	117,3	
Processed, Fresh (Fish & Shellfish):					126,5	127,6	133,7	10
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	1b.	.30	,32	102,1	110,6	217.7	7
Shrimp, Ige. (26-30 count), headless, fresh	New York	lb.	.77	.77	120.9	121.7	118.5	9
Oysters, shucked, standards	Norfolk	gal.	5.62	5,62	139,2	139.2	136.1	11
Processed, Frozen (Fish & Shellfish):					112,3	116.5	117.6	9
Fillets: Flounder, skinless, 1-lb.	_							
pkg.	Boston	1b.	.39	.39	102.1	102.1	104.7	10
Haddock, sml., skins on, 1-lb, pkg.	Boston	lb.	.29	.30	91.0	92.6	92.6	8
Ocean perch, skins on, 1-lb. pkg	Boston	lb.	.29	.29	114.8	114.8	114.8	11
Shrimp, lge, (26-30 count), 5-lb, pkg	Chicago	lb.	.73	.78	113.0	119.6	121,1	8
Canned Fishery Products:					102.4	102,4	102.2	10
Salmon, pink, No.1 tall (16 oz.), 48 can/cs Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.),	Seattle	case	21,27	21.70	120.0	120.0	120.0	10
48 cans/ cs	Los Angeles	case	11.80	11.80	85,1	85.1	85,1	93
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs	Los Angeles	case	7.12	7.12	83,2	83,2	81.7	8
Sarunes, Manie, Reviess OII, No. 1/4 Grawn	1					- 1		J

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs,
These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices,
2/ Revised.

slight change downward in fresh shrimp prices. The March 1956 subgroup index was higher by 21 percent when compared with March 1955 due to higher market prices for all the items included in this group.

The processed frozen fish and shellfish subgroup index for March 1956 declined about 3.6 percent from February 1956 because of lower prices for frozen haddock fillets (down 1.7 percent) and shrimp (down 5.5 percent). The subgroup index for March 1956, when compared with March 1955, was higher by 16 percent due almost entirely to higher frozen shrimp prices in 1956. Frozen shrimp prices at Chicago in March 1956, although lower than in February 1956, were higher by 32 percent over March 1955 prices.

The canned fishery products subgroup index for March 1956 was unchanged from that of February 1956 but was 2.4 percent above that for March 1955. Both canned pink salmon and Maine sardines were pricedhigher in March 1956 compared with the same month in 1955, but these increases were offset by lower California sardine and tuna prices.



WORLD FISHERIES ABSTRACTS

More than 2,500 abstracts, covering every branch of fisheries technology, have now been published in <u>World Fisheries Abstracts</u>, a bimonthly review issued by the Fisheries Division of the Food and Agriculture Organization of the United Nations, Rome.

The periodical, which is now in its seventh year of publication, is published in three separate editions (English, French, and Spanish) and more than 200 periodicals and publications from 31 countries are regularly reviewed in it. The subjects covered include fishing boats, factoryships, fish harbors, fishing gear and methods, fish handling and preparation, packaging, processing plants, fresh and frozen fishery products, ice manufacture, salting, drying, smoking, marinating, canning and other processing methods, byproducts, seaweeds, chemical analysis, and nutritive values of fisheries products.

The abstracts, which are frequently illustrated, are printed in such a way that they may be cut out and filed for ready reference. Nearly 600 of the 2,500 cards refer to fresh and frozen fishery products, more than 400 to fishing boats, nearly 400 to fishing and methods of capture, and more than 200 each to such subjects as salting, drying, and byproducts. There are nearly 200 dealing with canning, etc., and chemical analysis and composition, while some 150 are concerned with handling and processing, and more than 100 with fish and fisheries in general.

Copies of most of the back numbers are also available. Write to the Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, for further information.



International

INTER-AMERICAN SPECIALIZED CONFERENCE ON CONSERVATION OF NATURAL RESOURCES

MEETING ON THE CONTINENTAL SHELF AND MARINE WATERS: The Inter-American Specialized Conference on Conservation of Natural Resources: The Continental Shelf and Marine Waters, opened in Ciudad Trujillo, Dominican Republic, on March 15. The meeting was called pursuant to a resolution of the Tenth Inter-American Conference at Caracas in March 1954, for the purpose of studying various juridical, economic, and scientific problems related to the continental shelf and ocean waters of the western hemisphere.

Assistant Secretary of State for Inter-American Affairs Henry F. Holland was designated Chairman of the United States delegation to the Conference, the Department of State announced March 9. Ambassador John C. Dreier, U. S. Representative on the Council of the Organization of American States, was designated Vice Chairman of the delegation.

Other United States delegates were: William C. Herrington, Special Assistant for Fisheries and Wildlife, Department of State; Ralph L. Miller, Chief of the Fuels Division, U. S. Geological Survey, Department of the Interior; and William Sanders, U. S. Representative on the Inter-American Council of Jurists.

The following were appointed United States Advisers to the delegation: James E. Barr, Executive Secretary, Shrimp Association of America, Brownsville, Tex.; Stanley L. Beck, Lt. j.g., Office of the Judge Advocate General, Department of the Navy; Wilbert McL. Chapman, Director of Research, American Tuna Boat Association, San Diego, Calif.; Robert E. Hardicke, American Petroleum Institute, New York City; Rear Admiral Harold A. Houser, USN, Office of the Judge Advocate General, Department of the Navy; Milton J. Lindner, Fish and Wildlife Service, Department of the Interior, Mexico, D. F.; John Lyman, Chief, Division of Oceanography, Hydrographic Office, Department of the Navy; Oscar E. Sette, Office of Oceanic Research, Fish and Wildlife Service, Department of the Interior; Arnie J. Suomela, Assistant Director, Fish and Wildlife Service, Department of the Interior; Fred E. Taylor, Office of Special Assistant for Fisheries and Wildlife, Department of State; Edwin Thomasson, Geological Survey, Department of the Interior; Marjorie M. Whiteman, Assistant Legal Adviser for Inter-American Affairs, Department of State.

Henry Allen of the Office of International Conferences, Department of State, was secretary of the delegation, and William G. Bowdler of the Bureau of Inter-American Affairs, Department of State, was technical secretary.

FOOD AND AGRICULTURE ORGANIZATION

DESTROYING A MYTH ABOUT TILAPIA: Since the end of the war the world has become conscious of the "wonder fish"-tilapia (Tilapia mossambica). It has recently been talked about so much that some people are beginning to believe that if there is anything a fish can do the Tilapia

 $\underline{mossambica}$ can do it too, says the Food and Agriculture Organization.

<u>Tilapia mossambica</u>, which only breeds and can only live in tropical and semi-tropical areas, starts off with a lot of unusual qualities. It is

monogamous and it will breed in fresh, salt, or brackish water whether running or still. On top of that it is a mouth breeder; when the eggs have been laid and fertilized the mother fish takes them into her mouth and holds them there until they have hatched and gained some degree of independence more than a week later. Then for maybe another week the young fish continue to stay near the mother



and at moments of danger will return to take cover in her mouth. <u>Tilapia mossambica</u> is omnivorous. If feeds especially on plankton and vegetation, but it will also thrive on artificial foods such as the waste of rice, soya, and cocoa and various flours and oilcakes, reaching a weight of 4.6 to 5.3 ounces at about 10 months and sometimes going on to grow up to a weight of about two pounds in a period of years.

Its ready breeding in unfavorable situations and its rapid growth to edible size in the parly part of its life give the <u>Tilapia mossambica</u> the appearance of being ideally suited to fish farming and the appearent advantage given to the young fish by their unusual incubation, their habit of taking refuge in their mother's mouth in moments of danger are the foundations of the "wonder fish" legend.

Until 1939 the <u>Tilapia mossambica</u> was only known to exist in Mozambique and down part of the east coast of Africa. Then one day in 1939 five lone Tilapia were found swimming in a lagoon in Java. No other <u>Tilapia</u> mossambica had ever been reported in this area and none had ever been caught in the thousands of miles of ocean lying between Indonesia and Africa, the land of their origin. But there they were and while the ichthyologists were still puzzling over the manner of their arrival, the Japanese invasion of the East Indies in 1940 seriously interfered with trade in the milkfish or Chanos fry, which had been the backbone of the thriving fish culture industry of the area. The <u>Tilapia mossambica</u> had arrived mysteriously but very opportunely.

During the war the descendants of the five original immigrant <u>Tilapia mossambica</u>, and possibly of other <u>Tilapia which had arrived just as mysteriously but which had not been discovered</u>, spread out across the islands of Indonesia, Malaya, and up as far as Taiwan.

After the end of the war the Tilapia continued its travels with the assistance of the Food and Agriculture Organization of the United Nations. In quick succession it was taken to Borneo, the Philippines, Jamaica, Thailand, the Dominican Republic, India, and Haiti, to name only a few of the countries.

As a populator of areas where few fishes had been known before, <u>Tilapia mossambica</u> was a resounding success. In <u>Taiwan since 1946</u> it has become a common fish in open waters throughout the Island. By 1953, only a year after it was introduced to the Island, it made up 80 percent of the catch from certain lakes in Ceylon. Introduced into Haiti in 1951, it now makes up 90 percent of the catch from the open water of the Artibonite Valley.

Then it was discovered that the <u>Tilapia mossambica</u> would flourish in flooded rice fields and some observers found that in the presence of the fish the rice yields were increased—although other observers said the yield was unchanged and a third group said the yield was decreased.

With its unusual qualities, its mysterious arrival in Indonesia, and a few impressive figures like these, it is easy to understand how the inflation of the <u>Tilapia mossambica's</u> reputation started and why it is still going on.

But unfortunately, say serious workers in the field of fish culture, the Tilapia cannot support its reputation and is quite unsuitable as the mainstay of a serious fish-culture industry. It is a useful odd-job fish, a pleasant and dramatic introduction to fish farming for the inexperienced worker; it is more of a "toy fish" than a "wonder fish."

So as gently as possible they are trying to tear down the impressive structure of myth which this little fish is carrying.

They are being gentle because although not an adequate basis for a fish culture industry, the Tilapia mossambica can be quite valuable as a part of some fish culture industries and is often suitable for release in inland water areas. In the fish-culture industry it is an excellent fish to raise the interest of new fish farmers. These people are often not very enthusiastic about the industry and do not manage their water areas very seriously; but even though neglected the Tilapia will give quite good production and raise the fish culturist's enthusiasm for more serious farming. In certain countries they can be of value as a fill-in where the varieties of fish already in the streams and lakes are not exploiting all the food potential of the water areas. They are useful in the small ponds attached to individual farms where addition of nutrients to the ponds is haphazard and spasmodic. It is a good "forage" fish for larger fish which cannot make direct use of such foods as pond weeds on which Tilapia mossambica will thrive.

One of the main disabilities of Tilapia mossambica is low yields as compared with most other fish used in fish-culture industries. Certainly it grows very quickly to an edible size, but then its growth slows down very much. A good yield can be obtained only after very heavy stocking of a pond. Since Tilapia begins to reproduce at an early age, and then breeds prolifically, there is a possibility that, in the absence of careful control, a pond may become overstocked with young fish which will too vigorously compete for available foods for any of them to reach marketable size.

And the mother <u>Tilapia</u> mossambica's protection of her infants by taking them in her mouth is not very effective in practice. Where predatory fish are present, the <u>Tilapia</u> mossambica are among the first fish they eat, whether swimming on their own or sheltering in their mother's mouth.

Another reason for the gentleness with which FAO wishes to deflate the <u>Tilapia mossambica's</u> reputation is that while this species may have no great future in fish culture, some of the other species of Tilapia, and nearly 100 are known, may have much more future.

Two other species in which FAO is particularly interested are <u>Tilapia</u> melanopleura and <u>Tilapia</u> macrochir which at present are cultivated in the Belgian Congo, French Equatorial Africa, the Cameroons, and in certain ponds in East and South Africa. The two species have different feeding habits and are raised together in various proportions according to the abundance of the vegetation which is eaten by <u>T. melanopleura</u>. Under this system of culture, annual yields exceeding about 5 metric tons per acre have been reported.

The writer of an outline survey of the <u>Tilapia</u> family has this to say: "... the great qualities of <u>Tilapia</u>... should not cause it to be regarded as a miraculous fish whose introduction everywhere could only be beneficial and represent the ultimate

in hydrobiology and fish culture. Although the enthusiasm for this species must be brought into more normal proportions, the species will, nevertheless, still be of great importance because the rearing of <u>Tilapia</u> affords an important source of protein food which can have great extension in tropical countries, by cultivation as well as in open waters, in fresh waters as well as brackish, and in contributing to the struggle against mosquitoes.

"There are numerous species of <u>Tilapia</u> whose qualities, however, are widely different; according to Bonlenger (1909-16), there are 94 species and others have since been found. While a good understanding of the biology, ecology, and cultivation of three species of the genus <u>Tilapia</u> (<u>T. mossambica</u>, <u>T. melanopleura</u>, and <u>T. macrochir</u> has been gained, practically all the other species are as yet insufficiently known, notably in respect of their ecology and the possibility of cultivation. It is, therefore, uncertain that these species are the best in all circumstances. Moreover, the techniques of cultivation of <u>Tilapia</u>, dating from World War II, are too recent to be established.

"There is here a great field of research for biologists and fish culturists who in recent years and in many countries have directed their attention to this completely new problem of <u>Tilapia</u>."



Angola

FISHERY PRODUCTS AND BYPRODUCTS MANUFACTURE AND EXPORTS: The manufacture or production of finished fishery products and byproducts in Angola has climbed from 41,959 metric tons in 1949 to 85,349 tons in 1953 and 93,647 tons in 1954. For the first six months of 1955 it amounted to 41,220 tons.

Angolan exports of fishery products and byproducts in 1954 placed third, after coffee and diamonds, in value; and there are indications that further substantial increases may occur during the next decade, reports the United States Consulate at Luanda in a February 22 dispatch. Exports in 1954 included 52,690 metric tons of fish meal (valued at US\$6.9 million); 15,074 tons of dried fish (valued at US\$2.5 million); 11,416 tons of fish oil (valued at US\$1.8 million); and 1,828 tons of canned fish (valued at US\$1.0 million). The combined value of these fishery products and byproducts exports amounted to US\$12.2 million in 1954 as compared to US\$5.6 million in 1950 and US\$2.6 million in 1946.

The United States is Angola's best customer, taking a large portion of the fish meal exports.



Australia

SHORE-BASED WHALING, 1955: The Australian whaling season, which started on June 3 and ended on September 19, 1955, was one of the most successful to date. The average oil yield per whale was a record one at 51.77 barrels (48 U.S. gallons per barrel), and consequently the total oil production did not fall in proportion to the

reduction in quota of 100 whales each for the Point Cloates and Carnarvon stations. Total oil production reached 4,575,966 U. S. gallons, compared with 4,807,027 gallons in 1954, while the total Australian quota was reduced from 2,040 humpback whales in 1954 to 1,840 in 1955.

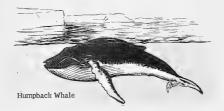


Table 1 - Whaling Results for Australian Shore-Based Stations, 1954-55				
Item	1955	1954		
Number of stations operating		5		
Whales taken (number)	2/1,840	1/2,039		
Average length (feet)	40.8	39.8		
Oil production (barrels)	95,258	100,068		
Yield/Whale (barrels)	51.77	49.1		
1/ Includes 1 blue whale, others all humpback,				
2/ Excludes 1 minke whale and 6 humpback taken for				
scientific purposes; all	humpback.			

Gross value of the 1955 season's catch was estimated at US\$4.4 million, comprising US\$3.7 million for oil and US\$0.7 million for the 6,358.7 long tons of meat meal and dried solubles produced during the season.



Belgium

SHRIMP FISHERIES: The shrimp catch by Belgian fishermen averaged about 4,470,000 pounds yearly during the 1952-54 period (table 1). The catch consists of

Table 1 - Belgian Shrimp Catch, 1952-55					
Year	Quantity	Value			
	1,000 Lbs.	1,000US\$			
1955	4,147	950			
1954		848			
1953		1,040			
1952		1,043			

the small size shrimp (250-350 headson to the pound) common along the shores of Western Europe. The exvessel value during the same three years averaged about US\$1,000,000 yearly, a February 14 dispatch from the United States Embassy in Brussels reports. The species caught is the

one known as gray shrimp (Crangon crangon L.).

The areas fished are located some 8 to 10 miles off Belgium and in the open sea off the Netherlands coast. Shrimp fishing is engaged in throughout the year, but the size of the catch is more important between the months of April to October (67 percent of the catch is made during that period). The principal shrimp fishing ports for the years 1952-54 were: Zeebrugge reported 65 percent of the annual landings; Ostend, 26 percent; Nieuport, 8 percent; and Blankenberghe, 1 percent.

At the end of 1954 the shrimp fishing fleet comprised some 151 coastal motor cutters having from 20 to 100 horsepower and a gross tonnage of 10 to 35 tons. The total tonnage of the shrimp fishing fleet at the end of 1954 amounted to 2,532 gross tons. The boats are owned primarily by individuals or partnerships, although some are the property of fishing companies. The crews total from 2 to 4 fishermen per boat. The size of the shrimp fishing fleet has declined continuously in recent years.

This decline in the shrimp fishing fleet is attributed, in part, to the high operating cost of the boats, which are from 10 to 30 years old. The catch is reported to be declining as a result of intensive fishing which has been carried on during recent years. Lack of working capital available to a large number of individuals or small groups of fishermen has handicapped, to a degree, replacement or rehabilitation of a number of the boats.

The gear used for shrimp fishing consists of floating trawler nets ("petit chalut a plateaux") with an average length of approximately 39 feet and a mesh stretched lengthwise of about 0.9 inches.

Practically all of the shrimp catch is marketed as boiled shrimp. The shrimp are boiled in salt water on the boats. The amount canned or frozen is reported to be negligible and the little preserving that is done is carried out at general fish-processing plants. Practically all shrimp are retailed unpeeled at approximately US\$0.54 a pound. Some are peeled by the retailers and are sold at US\$1.82 a pound.

Exports of shrimp (262,276 pounds, valued at US\$85,720 in 1954) represent only a small fraction of the catch and for the years 1952-54 amounted, on an average, to approximately 5.6 percent by volume and 7.6 percent by value. The principal country of destination was France and very small amounts went to other countries. No exports to the United States were reported.

The only assistance granted by the Belgian Government is that provided for by the law of August 23, 1948. This assistance is applicable to the fishing industry in general. According to this law the reimbursement of a loan advanced by an authorized bank may be guaranteed by the Government. The same guarantee may be extended for the purchase in Belgium or abroad of new fishing boats or for the placing of a new motor in existing hulls. In addition, the Government may pay for a portion of the interest due on loans up to a maximum of 50 percent of the interest rate. If the commercial banks are not desirous of concluding a loan, the Government may advance the loan under the conditions described above. There is a strict prohibition against foreign vessels engaging in shrimp fishing in Belgian ports and no foreign capital is invested in the industry.

Increasing costs of operation and declining catches have created a situation which is not particularly favorable for the expansion of Belgium's shrimp fishery. There is considerable resistance to modernization of existing equipment, although it is generally recognized that the present fleet is too old. Partly as a result of Netherlands price competition, the shrimp fishing industry claims that it does not make a sufficient profit at the present time to warrant an increase in its debt in order to purchase new equipment or rehabilitate old equipment. This situation has created somewhat of a dilemma and one which will result in a continuing decrease in the size of the shrimp fishing industry or the adoption of steps toward rationalizing the industry. It is reported, for example, that studies are being made to ascertain the possibilities of adopting shrimp boats for increasing other types of fishing during the off-season.

Note: Values converted to US\$equivalents on the basis of 50 Belgium francs equal US\$1.



Canada

BRITISH COLUMBIA SALMON FISHERMEN'S INCOME: Salmon purse-seiners and gill-netters earned more for their fishing efforts in 1954 than in 1953, but salmon troll fishermen made less money in the same period, according to a progress report on the economic survey of the salmon fishermen of British Columbia in 1953 and 1954.

The report covers a two-year investigation of changes in salmon fishermen's incomes from one year to the next, and factors affecting them. It was initiated at the request of fishermen and fish processing associations. It was begun in 1953 by the Fisheries Prices Support Board. Research was continued in 1954 by the Markets and Economics Service of the Department of Fisheries, that agency's <u>Trade News</u> (January 1956) states.

Pointing out that nearly 12,000 fishermen depend on salmon fisheries, which account for two-thirds of the landed value of all fish on the Canadian west coast, and, in finished form, provide between 2 and 3 percent of the total income of British Columbia, the report covers a survey of the three chief methods of salmon fishing: Purse-seining, gill-netting, and trolling. In making the survey fisheries economists matched 172 questionnaires covering 1954 salmon fisheries against those of the same fishermen completed for the 1953 season.

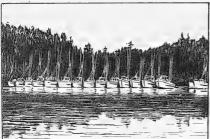
As the result of an increase in the proportion of the sockeye salmon catch, and a somewhat higher price for certain species, the 1954 salmon catch, although smaller in volume than 1953, yielded more income to salmon fishermen and brought the total salmon catch value to its third highest level in history.

Salmon gill-netters in 1954 shared a total of C\$10,600,000, of which nearly 60 percent was for sockeye. According to the report, gill-netters included in the survey showed an average gain of C\$152 in net cash income after deducting expenses, when compared with that of 1953. Purse-seine fishermen in 1954 divided C\$9,100,000, of which sockeye salmon contributed 45 percent. The average increase in net income to purse-seine captains reporting was C\$866, or 13 percent over the 1953 figures. Assistants in purse-seines showed an increase of C\$326.

Troll fishermen, relying chiefly on coho and spring salmon, which provide 98 percent of their total catch, received about C\$2,500,000 from the 1954 fishing, in which the catch of these species was considerably lower than that of the previous year. The survey showed that the net income for trollers declined by an average of \$96 or 4 percent less than the 1953 figures.

* * * * *

FISHERY COURSES FOR BRITISH COLUMBIA FISHERMEN: Thirty British Columbia fishermen went back to school for a two-week period, March 13 to 25,



Part of the British Columbia salmon trolling fleet,

when the second fisheries short course was held at the University of British Columbia in Vancouver, the January 1956 Canadian Trade News reports.

The course, which was initiated last year under a grant from the Canadian Department of Fisheries, aims to broaden the knowledge of practising fishermen beyond their specialized branch. Fishermen are brought up to date on latest fisheries information and fishing methods, and listen to lectures on fisheries biology, legal problems of the fishing industry, and fisheries conservation. Cooperation between

fishermen and government investigators in research and conservation programs is a major objective. Graduates from the school are expected to be able and willing to pass on to other fishermen in their areas any information gained from the course.

Lectures and demonstrations were given by instructors from the University faculty, Fisheries Research Board of Canada, the federal Department of Fisheries, and by individual specialists. Group discussions formed a considerable part of the course, and the class was scheduled to be conducted on various field trips, including a sea trip on a federal fisheries protection cruiser for demonstration of radar and other special equipment.

* * * * *

SALMON RIVERS PROTECTED BY LAW: The British Columbia Government has provided for close control of any project which might interfere with the free passage of fish in rivers of the Province, by amendment to the Fisheries Act in 1954.

Prior approval by the Minister of Fisheries must be obtained before construction of any change or utilization of the waters. Guarantees of protection of



 $fis\hat{h}$ are required, states a February 24 dispatch from the United States Consul in Vancouver.

By Provincial Order-in-Council, such protection was extended to all salmon and steelhead trout streams, and their tributaries, flowing into the Pacific Ocean, with the exceptions of the rivers listed below. Among the exceptions, are the Columbia and its tributaries, the Kootenay, Okanagan in part, and the Pend d'Oreille; the streams named are in general those where hydroworks already are constructed, or where salmon do not prevail, because of some natural barrier to their progress. Additions or exceptions may be made at any time by a new Order-in-Council.

Rivers Excepted From the Law: Stave River system above Ruskin, Allouette River system above the outlet of Allouette Lake, Jones Creek above the Trans-Canada Highway Bridge, Benaparts River above the Power Commission Dam, Bridge River above the confluence with the Yalakom River, Clearwater River above the falls 35 miles from the mouth, North Fork of the Quesnal River, West Road River, Nechako River above Grand Canyon, Willow River, Chilako River, Campbell River above Elk Falls, Cheakanns River above Garibaldi Station, Clowhon River system, including tributaries, Powell River system, including tributaries, Columbia River, Kootenay River, Pend d'Oreille River, Okanagan River above the S.O.L.P. Dam, and Kloiyah River.

Provided further, that unless the tributaries to the rivers and streams excepted above are specifically mentioned, such tributaries are not excepted.



Chile

FISHERIES TRENDS AND FISH MEAL PRODUCTION, JANUARY-NOVEMBER 1955: The Chilean Ministry of Agriculture reports that in the first 11 months of 1955 the 28 fish meal plants produced 30.1 million pounds of fish meal, utilizing 161.1 million pounds of fish. The Chilean whiting (Merluccius gayi) was the principal species used in the manufacture of fish meal. This species contributed 114.3 million pounds to the total quantity of fish utilized for fish meal.

The report also stated that the total fish catch for the 11 months was 336.2 million pounds with about 53 percent of this total used for human consumption.

During the first 11 months of 1955 the domestic over-all ex-vessel fish price for fresh consumption averaged about 3.75 U. S. cents a pound and the ex-vessel price for fish used for fish meal ranged from 1.0 to 1.7 cents a pound, according to a January 24 report of the United States Foreign Agricultural Service.

In order to prevent the extinction of whiting, the Government has prohibited the installation of new fish-meal plants from Coquimbo to Arauco, but permitting to the

north of Acoquimbo the use of sardines as raw material for meal. Some effort is being made to stimulate the plants to prepare fish for human consumption.

The 1955 international price of fish meal was excellent, resulting in a good income to exporters, but the price of other fish products, such as canned, smoked, salted, or frozen fish was low. This is one of the principal reasons for the increasing production of fish meal. The fish-meal trade complains against controls and the prohibition on building new fish-meal plants, stating that the fish used as raw material for meal are not suitable for human consumption, and further that the domestic channels for fresh-fish distribution are sufficient for normal demand.

The Ministry of Agriculture has requested the help of the Food and Agriculture Organization of the United Nations in order to obtain the service of an expert in market development and fish trade, and also is planning the organization of distribution cooperatives.



Ecuador

RECOMMENDATIONS OF FIRST NATIONAL FISHING CONGRESS: A preliminary report on the First National Fishing Congress held in Quito February 21-23 indicates that among the recommendations made were the following:

That operation of factory boats and mother boats in Ecuadoran waters be prohibited;

That bait fishing by groups of boats be prohibited unless the boats are at least a half a mile apart;

That domestic fishing companies be prohibited (beginning two years after passage of the proposed decree incorporating this recommendation) from chartering foreign flag vessels unless they own at least one Ecuadoran flag vessel for each foreign vessel chartered;

That measures be taken to restrict imports of foreign processed fish products, provided the domestic fishing industry adopts a production and price policy justifying such protection;

That no new shrimp concession be granted, that foreign flag shrimp fishing vessels now chartered by domestic companies be naturalized within six months, and that the Fishing and Hunting Department be empowered to regulate the number of shrimp vessels in use according to the amount of investment made by each company;

That a new General Fishing and Maritime Hunting Law be adopted, the administration of which would be centralized in a single government department;

That the funds allocated to the present Fishing and Hunting Department in the Ministry of Economy be substantially increased;

That a new commission to be called Comision Ecuatoriana de Fomento Pesquero (Ecuadoran Commission on Fisheries Development) be established, on which government, industry, and labor would be represented.

Resolutions were also passed endorsing the policy on territorial waters pursued by the Ecuadoran Government under the administration of President Velasco Ibarra, and the declaration issued by the Latin American delegates to the Inter-American Juridical Conference recently held in Mexico City.

Note: Also see Commercial Fisheries Review, April 1956, p. 31.



Egypt

SHRIMP FISHERIES: Official data on the production of shrimp in Egypt are unavailable, but an estimate obtained from trade sources places the annual catch at about 3,000 metric tons (6.6 million pounds), with an ex-vessel value of about US\$600,000. The only firm exporting shrimp in 1955 reported that about 1.1 million pounds were exported (nearly all to France) in that year. Some sample shipments have been made to the United States. There is only one freezing plant in Egypt engaged in freezing shrimp. This plant has a capacity of about 4 metric tons a day. France purchases chiefly boiled whole shrimp packed in 2-pound and 5-pound cartons, and small quantities of shelled frozen cooked shrimp.

The fishery for shrimp is incidental to fishing for other varieties and is carried on throughout the year. The best seasons are reported to be from November to March, according to a February 6 dispatch from the United States Consul in Alexandria. Although there are shrimp found along the entire Egyptian coast, the best areas are near Rosetta and Damietta where the shore is quite sandy. It is possible that Red Sea areas are productive, but due to distances from large cities and the lack of refrigeration facilities, this source has not been exploited.

There are three types of shrimp found in Egyptian waters: "greys," 16 to 30 to the pound; "pinks," 21 to 50 to the pound; and "browns," 15 to 25 to the pound. (The count is probably based on heads-on weight.)

Reports from trade sources indicate that with modern vessels and processing facilities the catch could be increased to about 33 million pounds annually. Earlier reports from Egypt 1/2 have indicated that one United States firm will or has invested in a firm that expects to catch and pack shrimp and spiny lobster tails for export. 1/2 Commercial Fisheries Review, November 1955, p. 50.



France

SHRIMP FISHERY: The shrimp fishery of France is relatively small, with the average annual catch for the three years 1952-54 only 2,220 metric tons. There is no fishery exclusively for shrimp, and the catch is incidental to other fisheries. The sizes are reported to be small and consist of shrimp ("crevette grise") and prawn ("bouquet"). Practically all the catch is consumed fresh, the price is high, and the sizes smaller on the average than the shrimp caught by United States South Atlantic and Gulf fishermen.

The principal ports where shrimp are landed are Dunkirk and Boulogne in the North; Honfleur and Caen in the Seine region; and St. Nazaire, Le Croisic, La Truballe Marenne, and Ile d'Oleron in the Atlantic region. Shrimp fishing takes place all through the year, but catches are generally better in the summer months (May-October).

The export trade in shrimp is negligible with only 17 metric tons exported to England and Switzerland in 1954. There is little possibility of any future expansion of the industry, reports a January 26 United States Embassy dispatch from Paris.



Finland

REVIEW OF THE FISHERIES, 1955: The catch of fish in Finland during 1955 was $\overline{\text{close to }65,000}$ metric tons of which slightly over 50 percent consisted of the small low-priced Baltic herring. There is usually a large surplus of the Baltic herring in the spring months, when the quality of the herring is poor. At this period of the year part of the herring catch is dried for animal food, chiefly by simple open-air methods and assisted by a Government subsidy to aid fishermen, states a December 22, 1955, report from the United States Embassy at Helsinki.

The catch of fishery products in Finland consists of about 33 percent freshwater varieties, but the fresh-water catch is about equal to the much larger saltwater catch due to the heavy catch of low-priced Baltic herring.

In 1955 Finnish fishing companies sent 4 vessels to Iceland to fish for herring in Icelandic waters. The total catch from this fishing was about 600 metric tons.

To promote the marketing of fish and to stabilize the seasonal fluctuations in price, the fishermen are planning the formation of marketing cooperatives in the principal coastal towns to operate freezing plants and selling rooms.

Exports of fish from Finland are insignificant. Imports consist chiefly of salt or sugar-cured herring from Iceland, canned sardines from southwest Europe and North Africa, and canned lobster meat from Soviet countries. Canned salmon, a new product on the Finnish market, is purchased from the Soviet Union.



Iceland

 $\frac{\text{FISHERIES}}{\text{ERENDS}}, \frac{\text{JANUARY-SEPTEMBER}}{\text{January-september}} \frac{1955}{\text{catch}}. \text{ The 1955 catch through September continued to top 1954's bumper summer fish catch by a small margin.}$ The haul of herring and ocean perch was equal to or better than that of the previous year. The market continued slow for frozen fish and stockfish, but very good for salted fish. The herring catch in quantity was the same but its value was better than the previous year.

Fresh Fish on Ice: Eleven of Iceland's 42 trawlers fished for the Germanfresh fish market in 1955, but it was generally unsatisfactory for the Icelanders. German trawlers caught so much ocean perch themselves that the prices were low. On several occasions Icelandic trawlers delivered their catches to Icelandic reduction plants rather than make the trip to Germany.

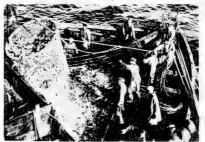
<u>Frozen Fish:</u> Although 10,000 metric tons less fish were diverted for freezing in 1955 than in $\overline{1954}$, the total for the first nine months of 1955 was still almost double that for the same period of 1953. Exports through September were lower than in 1954. As a result, the problem of frozen storage space became acute during the summer. It still was in November 1955, even though November was developing into a banner month with anticipated shipments of about 7,000 tons. The Soviet Union agreed to accept 8,000 over the minimum set by the USSR-Icelandic

Agreement and shipments to Czechoslovakia were going forward. Those to the United States continued markedly lower than a year earlier.

As a result of the excess stocks, some plants ceased to accept fish for freezing and in such cases boats had to divert their catches of ocean perch to the reduc-

tion plants. Lively discussion has resulted regarding ways and means of increasing storage capacity of present plants and building new ones. Although some concrete steps may result, they are not likely to be far-reaching, the general opinion being that the real problem lies more in increasing sales and making Icelandic fish competitive in price.

The production of frozen fish for the first nine months of 1955 totaled 43,721 metric tons as compared with 41,976 tons for the same period in 1954.



Brailing a good catch of herring.

Stocks were high in the third quarter of 1955, but that situation was expected to be relieved later in the year. To all intents and purposes the frozen fish market means the United States, Soviet Russia, and Czechoslovakia, who together account for over 90 percent of total frozen fish exports. Eastern Germany takes 5 percent.

Stockfish: Following the previous year's excellent sales of stockfish, there was a 16-percent increase in the total white fish processed in this manner in the spring of 1955. Through September 30, 1955, however, shipments were running well under half of the 1954 level, both in quantity and value. Over two-thirds of this went either to Africa direct or the United Kingdom for reshipment to Africa.

Salted Fish: The year 1955 has been a banner one for salted fish with prices good and a strong demand for all that Iceland produced or had in stock. This was to some extent foreseen, because the amount diverted to salting was increased from 81,000 tons as of October 1, 1954 to 97,000 tons as of October 1, 1955. The net weight of this fish after processing was 42,349 tons in comparison with 36,571 tons in 1954. Of the 1955 total, 26,629 tons was motorboat-caught; 15,720 trawler-caught.

1955 Herring Season: Although the total herring catch through September 1955 was almost precisely the same as in 1954 in weight (45,000 tons), the amount salted was almost double (32,000 tons in comparison with 17,000 tons). The income from the catch was expected to be correspondingly larger.

<u>Fish Meal</u>: Iceland's largest fish-meal sales are to the United Kingdom and West Germany, which together take almost 50 percent of the total. The rest is scattered to many customers. None is listed as going to the United States. There was less herring meal produced in 1955 than the previous year because much less north-coast herring was diverted to the reduction plants.

 $\underline{\text{WHALING SEASON}}$, $\underline{\text{1955}}$: The whaling season began May 29 and closed September $\underline{\text{21.}}$ It was the best experience since the company conducting the whaling started operation.

Practically all of the meat has been sold frozen to the United Kingdom. Sweden is the best customer for whale oil, and Iceland for whale meal.

The good whaling results were obtained in spite of unfavorable weather during most of the season.

Table 1 - Icelandic Whal	e Catch,	1954-55	[
Type	1955	1954	L
	(No	0.)	
Blue	10	9	Г
Fin	236	177	- 0
Sei	134	92	15
Sperm	20	54	I
Other	-	1	1
Total	400	333	- (

The company is permitted to engage in whale fishing for six months of the year but has thus far very seldom ex-

Table 2 - Icelandic Production of Whale					
Products, 1954-55					
Product	1955	1954			
	(Metri	c Tons)			
Oil	2,062	1,294			
Sperm oil	187	492			
Meat	1,899	1,438			
Meal	1,281	853			
Other 1/	128	123			
Total	5,557	4,200			
1/ Edible fibrous substance from the plaited undersurface of the rorqual (fin).					

ceeded four months. Furthermore, the company has only 4 whalers, none of which are of the latest type, but its total possible catch is not limited.

* * * * *

MARINE OIL PRODUCTION, 1955: Whale oil production in Iceland was up in 1955, due largely to one of the largest whale catches in the last decade (400 whales were killed as compared with 333 in 1954). Whale oil production in 1955 was 2,273 short tons as compared with the 1,426 tons produced in 1954. Sperm oil production was down from 542 tons in 1954 to 206 tons in 1955. Total whale and sperm oil production in 1955 was 2,479 tons, or an increase of 26 percent from the 1,968 tons produced in 1954, a December 5 dispatch from the United States Embassy at Reykjavik states.

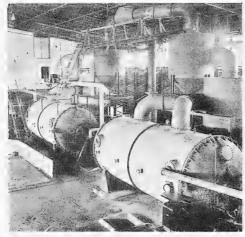
Exports of whale oil through the end of September 1955 were 1,120 tons, all of which went to Sweden. The remaining stock was expected to be shipped by early in 1956.

Current prices for whale oil are from £85 to £87 a metric ton (US\$216 to \$221 per short ton) c.i.f. Those for sperm oil are about £70 pounds (US\$178 per short

ton) c.i.f. Prices fluctuated very little during the year and were about the same as the previous year.

Although the herring catch to September 30 was almost exactly the same as in the same period in 1954, production of herring oil was expected to be smaller because a considerably larger proportion of the catch was salted. Herring oil production through the first 9 months of 1955 was 1,433 tons. Total productionfor all of 1954 was 4,178 tons; and for 1953, 5,467 tons.

As of December 5 no commitments had been made for large-scale exports of the 1955 herring oil production. In 1954 exports went largely to the Republic of Germany and Norway. Herring oil was currently selling at from £70 to £76 per metric tons (US\$178 to \$193 per short ton) c.i.f.



A large and completely modern herring- and fish-processing plant in Faxa Bay, southwestern Iceland,

Production of cod-liver oil was reported at 10,031 short tons for the first 9 months of 1955 as compared with 11,303 tons during the entire year of 1954. Exports through September totaled 9,041 tons as compared with 9,436 tons during the same period in 1954. Almost a quarter of the 1955 exports went to Norway, with the remainder largely to the Netherlands, the United States, and the United Kingdom. The present December 5 price of bulk oil was about £82 per metric ton (US\$230 per shortton) c.i.f. That for medicinal oil was around £113 per metric tons (US\$287 per shortton) c.i.f., including the drums.

Ocean perch oil production through the first 9 months of 1955 was 3,086 tons as compared with 3,034 tons during the entire year of 1954. Practically all of the 1,667 tons of this oil exported through the first 9 months of 1955 went to Norway. The price of ocean perch oil December 5 was about £77 to £78 per metric ton (US\$196

to \$198 per short ton) c.i.f.

It is reported that the present marketing outlook for whale, herring, and other fish oils is good. There is a ready demand, and no drastic changes either in demand or prices are anticipated in the near future.



Israel

REVIEW OF THE FISHERIES, 1954: Israel's fishing industry was beset by a number of difficulties during 1953 which were reflected in a slight decline in the fish haul from 7,493 metric tons in 1952 to 7,458 tons in 1953. During 1954, however, output rose steeply by 21 percent to 9,000 tons, following the restriction of imports and other measures implemented by the Government.

Table 1 - Israel's I	ishery	Landings	1950-54		
Type	1954	1953	1952	1951	1950
		(N	letric Tor	ns)	
Lake fishing	989	781	1,046	927	707
Inshore fishing	610	599	585	625	788
Pelagic fishing	385	337	460	446	100
Deep-sea fishing	1,413	1,226	953	884	1,040
Fish ponds	5,605	4,515	4,449	3,847	3,897
Distant-waters fishing by		_		-	
Israeli ships	-	-	333	1,397	487
Total	9,002	7,458	7,493	6,730	6,432

In view of the restricted supply of meat in Israel, fish constitutes one of the chief sources of animal protein. Local production during 1950 covered some 38 percent of total consumption, as compared with 30 percent in 1953. Much remains to be done, therefore, before self-sufficiency is achieved in this field, states the publication Israel Economic Survey, 1953-54, issued by The Economics Department of the Jewish Agency.

Current plans provide for a large expansion of production during the coming year. Eight new fishing trawlers ordered within the framework of the Reparations Agreement have already arrived and others are at present under construction. Each trawler is equipped with electronic devices for locating schools of fish. Fishing in distant waters, which was discontinued in 1953, is to be renewed on an increased scale. Large ocean-going boats, capable of remaining at sea for three months at a time, have been ordered for service in the Atlantic.

Particular importance is attached to the development of inshore fishing, which could provide several times the present haul. The decline in this area of fishing

was mainly responsible for the contraction of total output in 1953. Deep-sea fishing is also developing rapidly.

The expansion of the fishing fleet has also raised the question of establishing additional dock and service facilities. New space is to be provided, among other

places, in the Kishon Harbour, together with a refrigeration plant, workshops, stores, and a slipway.

Carp breeding in ponds has increased steadily during years and accounted for some 62 percent of domestic fish production in 1954.

Table 2 - Israeli Fish Consumption and Imports				
	1954	1953		
	(Metric Tons)			
Total Consumption:	23,900	24,990		
Domestic Production	9,000	7,460		
Imports	14,900	17,530		
Percentage of Domestic Production to Total Consumption	38%	30%		

A trial shipment of tinned carp was dispatched to the United States at the end of 1954 and plans are advanced for exporting small breeding carp to Europe. Prospects in both markets are considered promising.



Japan

NORTH PACIFIC LONG-LINE SALMON FISHING: Since the published results of the experimental salmon long-lining by the Tenyo Maru had aroused extraordinary interest, the attitude of the Fisheries Agency on this question was being closely watched, the Japanese newspaper Nippon Suisan Shimbun (February 27) points out. The salmon long-line fishery, which had been a free fishery, was made subject to licensing by the Minister of Agriculture and Forestry by executive order, and it was made clear that, while vessels which had taken part in the fishery in 1955 would be licensed, those wishing to enter the fishery for the first time in 1956 would not.

According to the same newspaper for March 1, the authorities estimate that there are about 200 vessels that would qualify for licenses to long-line for salmon. Their operations would be limited to waters south of 48° N.

On February 21 the Japanese Fisheries Agency called a conference of cognizant department heads from Hokkaido and 14 prefectures on the following problems of the North Pacific salmon fisheries: (1) salmon long-lining; (2) salmon drift-netting south of 48° N., (3) penalties for vessels disregarding the regulations of the salmon drift-net fishery, and (4) the schedule for inspection of vessels taking part in mothership-based salmon fishing.

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TRAINING SHIP CATCHES TUNA IN HAWAHAN WATERS: The Shimane Prefecture fishery training ship Shimane Maru, after carrying out its third cruise in Hawaiian waters, returned safely to its base at Miaki in Kanagawa Prefecture on February 7 with a full load of over 180 tons of tuna. The catch was in good condition and brought US\$45,000, states Nippon Suisan Shimbun (February 27), a Japanese newspaper.

The ship sailed again from Misaki on February 18 to make its fourth cruise in the Indian Ocean. There are 13 students aboard from the industrial and fishery high schools of Shimane Prefecture. The Shimane Maru is expected to return to port late in April.

Kenya

SOUTH AFRICANS MAY ESTABLISH FISHING INDUSTRY OFF KENYA: The Kenya Government signed an agreement with South African businessmen in October 1955 to explore the Indian Ocean waters off Kenya for commercially-valuable fish. A small pilot company has been formed to explore Indian Ocean waters. The company is backed by considerable resources in money and equipment. Should the pilot scheme prove that there are sufficient fish to warrant the erection of freezing plants, the South Africans are prepared to invest about US\$560,000 for fishing boats, processing plant, and distribution facilities.

Preliminary to the present project, the East African Research Organization founded in 1949 has made extensive studies of the movements, migratory habits, and other factors that may be valuable to the commercial interests. The Research Organization has found schools of bonito, yellowfin tuna, and skipjack.

At the present time Kenya's fishing industry is confined to coastal inshore waters and the catch from this source is estimated to be about 5,000 metric tons a year. In addition, the colony produces about 11,000 tons of fresh-water species from Lake Victoria. The catch of fresh-water fish includes 3,500 tons of tilapia. Although the demand for fish is good, the colony suffers from lack of modern distribution and freezing facilities, reports the South African Shipping News and Fishing Industry Review for November 1955.

The pilot scheme is to determine whether the ocean fish off Kenya's coast are commercially exploitable in sufficient quantities to justify a fish processing industry in the Colony. Kenya fishery experts are convinced, by their own experiments, that year-round open-sea commercial fishing is possible and that it can become a major economic factor and food source in the territories.

A report from Nairobi (Kenya) states that the Kenya Government is giving South Africans—who represent some of the largest fishing concerns in the Union—its full support and will lend them the research vessel Meniha for the pilot scheme, which is expected to cost about US\$9,800. The South Africans will send their own crew and equipment to Kenya, including nets which are not imported into the Territory.

If the results are favorable when the scheme ends April 1956, the group will hold discussions with the Government regarding the formation of a company. Meanwhile, preparations are being made to schedule the fish-processing industry under the East African Industrial Licensing Ordinance,

It is impossible to calculate how much return the South African financiers will receive on their capital if they start in East Africa, but they will have an immediate market once marketing and distribution problems have been overcome, and will almost certainly be able to export later.

Many of the necessities for a commercial, open-sea fishing industry already exist. There are adequate landing facilities at Lamu, Malindi, and Mombasa; there is plenty of space on the coast for the erection of processing factories; electricity is fairly easily available around Mombasa and at other East African ports; the thousands of fishermen on the coast are a good source of labor and the registration fee for a trawler or motor vessel is only US\$0.42.



Republic of Korea

<u>ICE-MAKING MACHINERY TO AID FISHERIES ARRIVES</u>: Machinery for ice-making plants to benefit the fisheries industry in a dozen communities of the Republic of Korea has arrived in that country under the aid program of the United Nations Korean Reconstruction Agency (UNKRA).

The equipment includes 20 ammonia compressors with a total capacity of about 1,000 tons of ice per day. Individual compressors range in capacity from 20 tons to 120 tons per day, a March 6 news release from the United Nations points out.

They will be sold to fisheries associations or private plants, most of them in ports. Among the communities scheduled to receive them are Pusan, Kunsan, Yosu, the island of Huksan-Do off the southwestern coast, the island of Yokchi-Do off the southern coast and the east coast towns of Kampo, Kanggu, Pyonghae, and Pango Jin.

They were brought to Korea as part of a \$232,000 UNKRA project for importation of equipment to improve the handling of fish and prevent waste caused by spoilage. With the arrival of the recent shipments, procurement of ammonia compressors called for by the project has been completed.



Mexico

COAST GUARD TO ACQUIRE SEAPLANES FOR COASTAL PATROLS: The Mexican Coast Guard, according to the newspaper Excelsior, is intensifying its campaign against foreign fishing fleets in Mexican coastal waters. According to reports, the Coast Guard intends to acquire seaplanes for patrolling the Mexican coasts, a February 28 United States Embassy dispatch from Mexico points out.

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EXPORT DUTIES FOR SKINS, FINS, AND LIVERS OF SHARKS REDUCED: Effective December 1, 1955, the Mexican export duties for shark skins, shark fins, and shark livers were greatly reduced. The following ad valorem rates are now in effect with the former rates shown in parentheses:

15-13. Untanned shark skins, fresh, dry, or salted, 5 percent (15 percent)

15-30. Liver and liver scraps of shark and other kinds of fish, 3 percent (10 percent)

15-91. Shark fins, 5 percent (10 percent)

CORRECTION

In the January 1956 issue of <u>Commercial Fisheries Review</u>, page 53, under Mexico, the statement "Canned spiny lobster" is incorrect according to advice received from a Mexican authority. This authority states that spiny lobsters are not canned at Ensenada or elsewhere in Mexico. All the production is exported frozen. In table 4 the "Lobster, spiny" under "Canned" should be added to "lobster, spiny, cooked" under "Processed,"



Netherlands

SHRIMP FISHERIES: Production of shrimp in 1955 amounted to 19,358 metric tons of which an estimated 275 metric tons was not marketed for failing to reach the minimum price. However, 1955 results were considerably better than in the immediate preceding years and the 1954 catch of 14,291 metric tons may be more representative of the period 1952-1955, a United States Embassy dispatch (February 7) from The Hague points out.

Exports of shrimp in 1955 totaled 2,207 tons (quantity landed in Dutch ports and destined for export), compared with 1954 exports of 1,516 tons.

The total catch of shrimp for the three-year period 1953-1955 was 50,241 tons. Of this amount, approximately 35,000 metric tons of small immature shrimp were used for the production of fish meal for poultry feed. The size of the whole shrimp ran between 275-315 per pound for export and 360-410 per pound for home consumpton. The local catch consists of "baby shrimp" as they are termed in world trade.

Shrimp exports during 1953-55 totaled 6,080 metric tons, valued at F1. 12,956,000 (US\$3.4 million), of which quantity almost 95 percent was exported to Belgium and France with each country taking almost equal amounts although the French preference was for unpeeled and the Belgian for peeled shrimp. The remainder went to West Germany and Great Britain for the most part. There were no more than relatively insignificant shipments to the United States in 1953 and 1954 (three tons each year) because the Netherlands shrimp are considered too small, soft, and tasteless for the American market. Exports were confined to peeled or unpeeled shrimp (fresh) with the latter accounting for between 70-85 percent of exports, depending on the selected year. There are insignificant exports of frozen shrimp during the hot months. Shrimp destined for export are cooked in heavily-salted water while those for domestic consumption are only slightly salted for reasons of taste preference.

The principal fishing areas are: (1) the Ems Estuary, (2) the coasts of the Provinces of North and South Holland, (3) the estuaries around the Province of Zeeland, and (4) the Waddenzee. The best catches are made from March through June and from August through November. The shrimp fishing fleet consists of very small cutters of about 26 feet in length and a tonnage of about 10.2. The annual number of vessels engaged in shrimping is about 350, the number being controlled by the Government through the issuance of licenses. The vessels usually have a keel but flat-bottomed craft are also in operation. The usual equipment is the ottertrawl or the beam trawl, depending on the composition of the sea floor. In the Ems Estuary, shrimpers also use special shrimp nets, the hose net. The vessels may or may not be equipped with engines, but the motors may not exceed 80 hp.

The catch is cooked on board the fishing craft immediately after being caught.

There are no factories engaged solely in the canning or freezing of shrimp and the little that is done is usually carried out at factories of the general fish-processing industry. A few individual shrimp wholesalers have freezing facilities of their own which are used only for that dealer's export stock and only during the hot months of the year. There is not, therefore, any systematic freezing of shrimp for export.

The processing of the smaller shrimp into fish meal is carried out by the regular fish-meal factories and also by small operators who undertake the drying before passing on the shrimp to the next stage. The fish-meal industry is situated in the Provinces of Friesland, Groningen, North Holland, and South Holland.

Under the supervision of the Marketing Board for Fisheries Products (a semi-official body representing all sectors of the fishing industry from production through sales), shrimp fishers pay a levy to a fund from which fund payments are made to fishermen for shrimp which do not reach a minimum price fixed by the Board. The Board's agents control the size and quality of landed shrimp while peeled shrimp are controlled by the Commodities Inspection Service. The Marketing Board also issues the required license to individual fishermen, a license valid for one calendar year. The licensing is primarily intended to keep a balance between production and consumption in order that the established minimum price policy will not be undermined. The Board may also indicate the ports at which shrimp must be landed and it may fix the quantities and varieties to be landed. The minimum size set for export has been $6\frac{1}{2}$ centimeters and that for domestic consumption has varied between $5\frac{1}{2}$ and $6\frac{1}{2}$ centimeters.

The potentialities for expansion of the shrimp industry as a whole are not believed to be favorable since the Government is interested in keeping the balance between present consumption and production. Since a great increase in consumption or exports is unlikely, it is not probable that production will be greatly expanded. This in turn creates little incentive for the development of a sizable canning or freezing industry. The labor supply (now short) also is a limiting factor in achieving a greater production and is especially noticeable in the peeling sector.



New Zealand

FISH SURPLUS: The New Zealand Fishing Industry's dilemma early in 1956, namely a serious glut of fish on the market, with frozen stocks up to capacity, and a generally inactive market, has been attributed to many factors. The industry largely blames the recent cut in the Australian import quota for New Zealand fish (which it states is even further aggravated by the current Australian wharf strike) together with the normal seasonal drop in local consumption in the face of this year's peak catch, while the public, although in agreement with the industry so far as the Australian import situation is concerned, claims on the other hand that the local situation of inadequate sales is a sign of successful consumer resistance against the needlessly high prices imposed by the industry.

The latest official published figures on New Zealand fish catches and exports are for the calendar year 1954. These indicate that on the basis of value 62 percent of the principal classes of fishery products marketed that year were exported. Spiny lobster or crayfish accounted for about 75 percent of the value of all exports and the majority of these went to the United States. Australia is the next importer of New Zealand fish products, but only absorbs by value about 12 percent of the total exports.

Recently, the Australian Government announced that its import quota of New Zealand fish would be reduced. This reduction in Australian import licenses has, according to the Secretary of the New Zealand Wholesale Fish Merchants' Association, "required New Zealand fishermen to reduce their catches for some weeks past," and indications by other members of the industry have been that in parts of the country where stringent catch limits have been imposed, in the absence of relief from the Australian quota, prices will have to be raised in order to give a fair return to the fishing industry.

According to New Zealand Government sources, some relaxation of the Australian import restrictions on New Zealand fish is expected soon.

The Fishing Industry states that "the first requirement for making fish available to the public is to provide a reasonable return to the fisherman whose costs of catching have soared in recent years." The policy of the industry is to make available to the New Zealand public all the fish that can be consumed in those areas to which it can be safely transported, and the industry emphasizes that only the surplus is exported. Lack of inland transport facilities is given as a major stumbling block to expanded domestic markets.

The industry further explains that the method of marketing, namely purchase by the wholesalers of practically all the fish landed by the fishermen, keeps the prices down because the fish is bought in large lots and what cannot be sold on the local market is frozen and stored for export. Included in the fish prepared for export, according to the trade, are a number of varieties which are not acceptable to the New Zealand public but for which there is a satisfactory demand abroad, especially in Australia.

Regarding the industry's obligation to the public, industry spokesmen complain that unfortunately the New Zealand public has a most marked preference for fresh fish and does not willingly purchase the frozen product. During the hot weather local consumption of fish in New Zealand is considerably lower than normal; and because this period is the heaviest catching season, if the fishing industry is to operate economically, a considerable portion of the catch must be frozen (and subsequently exported), states a January 30 dispatch from the United States Embassy at Wellington.

The Secretary of the Wellington Retailers' Association stated that New Zealanders were just not fish eaters and blamed the high fish prices on the public. "We have tried putting cheap fish on the market but the public just won't buy it. If they see fish cheap they think something is wrong with it. And they won't take the whole fish. They want them boneless and skinless. Retailers have to buy three pounds of fish for one pound for the public."

The public, faced with the fact of Australian restrictions, has considered the attitude of the New Zealand fish industry as negative in the extreme, especially the indications that the catches will be severely reduced and the standing overhead costs covered by higher local prices. The critics of the industry's policy state that there is great scope for increased sales locally and that the block to increased sales is the high retail price, not New Zealand eating preferences.

In the opinion of some wholesalers and retailers, the present overstocked conditions will inevitably force the price of fish down and there are already evidences of slight undercutting of wholesale prices.

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FISHERIES TRENDS: Most fishery products in New Zealand are produced for domestic consumption. However, exports of frozen spiny lobster (crayfish) tails to the United States have mushroomed with shipments amounting to almost US\$3 million in 1955 as compared with none several years ago. There has been considerable interest by United States and New Zealand firms in this development and exports may increase further, states a United States Embassy dispatch (February 23) from Wellington. At the same time questions have been raised in Parliament as to possible overfishing of spiny lobsters and there has been some grumbling that exports to the United States have caused prices to rise in the domestic market.

The export market in Australia for New Zealand frozen fish was adversely affected by the imposition of reduced import quotas by Australia and has caused difficulty for the New Zealand trade. Stocks accumulated at the end of the year, and representations will probably be made to Australia to liberalize quotas. At the same time dissatisfaction has been voiced at the high retail prices and the poor quality of fish sold domestically; compared with meat prices, some fish is relatively expensive.

The waters around New Zealand abound in fish and prospects for exploiting this resource are being explored.



Norway

WINTER HERRING CATCH NEAR RECORD: The first phase of the Norwegian fat or winter herring fisheries off western Norway ended at midnight, February 14. The total catch of fat herring was estimated to be 865,800 metric tons, only 1,800 tons less than the record year of 1954. It is possible that the 1954 record will be exceeded when the final figures have been compiled. The ex-vessel value of the 1956 winter herring catch was close to US\$28.3 million as compared with US\$21.0 million in 1955. The sales value of the 1956 catch is close to US\$56.0 million. About 80 percent of the fat herring catch was taken by purse-seiners.

Two of the purse-seiners landed almost 3,000 tons each, and 22 reported about 2,000 tons each, and 58 caught 1,500 tons each.

More of the catch this year than in 1955 will be utilized for fish meal and oil because of the strong market for these byproducts as opposed to only a fair market for salted herring.

The fishery for spring herring, which usually lasts until the end of March, was off to a good start. At the end of the first day of the season, February 15, the fishermen had landed nearly 30,000 tons, states the February 23, News of Norway, a publication of the Norwegian Information Service.



Pakistan

POTENTIAL MARKET FOR FISHING BOAT ENGINES: More than 1,000 fishing boats in the Karachi administration area and some hundreds on the Makran and Sind coasts of Pakistan may provide a lucrative market for manufacturers of fishing boat engines, if plans develop for the mechanization of the Pakistan fishing fleets, a February 17 news release from the Food and Agriculture Organization points out.

Most of the existing boats, which range from small craft to vessels of 60 feet over-all, are suitable for mechanization, according to a report on the "Mechanization of West Pakistan Fishing Boats," submitted by FAO to the Government of Pakistan.

The Report was written by four naval architects of the FAO Fisheries Division and is based on work carried out by them between 1953 and 1955, after FAO was requested by the Pakistan Government to make a study of "certain local types of fishing vessels used on the West Pakistan coast," with the object of improving the design of the boats so that they could be mechanized.

After extensive investigations and model tests, the naval architects found that most Pakistan fishing boats were comparable and, in many cases, superior-so far as resistance is concerned-to the design of fishing boats in Europe and North America. As a result, the architects found that the resistance of West Pakistan boats could be decreased by only 10-20 percent by means of improved hull design, compared with a decrease of 30-40 percent which they had usually found feasible in the ordinary fishing boats of western countries. The practical effect of such improvement is to increase the speed of the boat without adding to the power of the engine. Considerable savings can also be made in fuel consumption, sometimes as much as 30 percent if the speed is kept constant.

Most of the Pakistan fishing boats can be fairly quickly and easily mechanized. The naval architects have recommended that the small boats, such as the "tony," "dhatti hora," and the "ekdar," should be equipped with heavy-duty low-speed outboard motors of about 4 hp., with 12-in. extended shafts and bronze underwater parts. In the case of the bigger boats, especially the excellent "bedi" types which range from about 44 to 60 feet, it is recommended that inboard motors of about 20 hp. should be installed, preferably semi-Diesels or Diesels. Such engines would enable the boats to sail at about $7\frac{1}{2}$ knots.

The main suggestions made by the naval architects concerning structural modifications to boats are to strengthen them and introduce fixed decks, which would enable the boats to fish in rougher weather.

As so many of the fishermen themselves have become aware of the advantages of mechanization of their boats, and the policy of the Government of Pakistan is aimed at mechanization of the fishing fleets, conditions are favorable for the development of this market, if manufacturers are able to organize training in the operation, care, and maintenance of engines, and provide an adequate spare parts service.

The FAO report provides a valuable guide to the conditions and problems which exist in this potential market. It is a comprehensive document which deals in detail with the construction of new boats, mechanization of available boats, and technical and financial aid. It contains a wealth of technical detail in tabulated form as well as more than 30 diagrams on various aspects of boat construction, design, and mechanization proposals.

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SHRIMP FISHERY: Shrimp are found in commercial quantities on both the east and west coasts of Pakistan. The fishery for shrimp is being developed with the aid of a United States International Cooperation Administration technical advisor and the prospect for increased production is good. Prior to 1955 shrimp were taken in commercial quantities in the delta of the Indus River of West Pakistan and in the Brahmo-Ganges delta in East Pakistan. Smaller catches are taken along the coasts of both East and West Pakistan and also by damming tidal creeks in the eastern area.

The shrimp fishery is carried on throughout the year but the bulk of the catch is taken in the West Pakistan area during the months November to March. The east coast fishery is best from October to April and year-round from the dammed tidal creeks (called "besha badha" fisheries).

The fleet of shrimp boats consists of 150-200 small sail and nonmechanized craft. About 80 percent of the catch is taken by beach seines; 12 to 14 percent by tidal-operated barriers; and 6 to 8 percent by cast nets.

In 1953/54 a shrimp freezing firm owned jointly by a United States firm and Pakistan nationals was started. This firm exported 5,000 pounds of frozen shrimp to the United States in 1955. The machinery for a second plant has arrived and will be set up on the new fish harbor now under construction. In addition a small canning plant was established in 1954 and it is now canning about 200 to 500 pounds a day. Efforts are being made to expand the output of canned shrimp.

No taxes are levied on foreign firms and foreign investors are allowed to invest as much as 60 percent of the total investment.

The estimated Pakistan shrimp catch was 10,930 metric tons in 1954, 13,925 in 1953, and 15,479 tons in 1952. The catch is made up of the species indicated in table.

Species	Percent of Catch
Peneus indicus	50-55
Metapeneus sp	15-20
Peneus marguensis	10-15
Peneus semisulcatus	10-15
Perapeneopsis sp	5

The present trend of the shrimp fishery in Pakistan is that the abun-

dance is much larger than present catches would indicate, according to a January 18 dispatch from the United States Embassy in Karachi.

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SECOND SHIPMENT OF SHRIMP TO UNITED STATES: It was announced the latter part of February 1956 that a shipment of frozen shrimp totaling 20,000 pounds left Karachi, Pakistan, for the United States. This is the second shipment to the United States made by a company which started operations last year with United States capital participation, a February 24 United States Embassy dispatch from Karachi announces.

Note: Also see Commercial Fisheries Review, September 1955, p. 107.



Republic of the Philippines

SHRIMP FISHERIES: The catch of shrimp in the Philippines amounted to 2,641 metric tons (valued at US\$2.0 million) in 1954, compared with 1,618 tons in 1953, and 1,311 tons in 1952. Exports are confined to small salted shrimp ("bangoong alamang") and varied in quantity between 1,300 pounds in 1952 and 16,700 pounds in 1954; in 1955 exports totaled 13,100 pounds. Salted shrimp are considered a delicacy by the Filipino residents in Guam and Hawaii.

The shrimp fishery in the Philippines is not specialized as in the United States. Shrimp are caught along with other varieties of fish by beam or otter trawls fished by motorized sampan-type wooden vessels, a United States dispatch dated January 11 from Manila states. The principal fishing grounds, with yields of 50 metric tons or over, are located in Carigara Bay, Guimaras Strait, Manila Bay, Magueda Bay, Samar Sea, San Miguel Bay, Sulu Sea, and Visayan Sea. There are no shrimp canneries and there is only one commercial freezer, located in Manila.

The principal species of shrimpare as follows: Peneaus indicus (Milne-Edwards); P. canaliculatus (Olivier); P. affinis (Milne-Edwards); P. incisipes (Spence-Bate); and P. monodon (Fabricius). The sizes (heads-on) vary between 4 and over 100 to the pound.

The shrimp fisheries do not receive governmental assistance and there are no foreign vessels engaged in this fishery. Licenses to operate fishing vessels, subject to taxation, are issued to United States citizens on the same basis as to citizens of the Philippines.

The greatest potentialities for expansion of the shrimp catch is the cultivation of shrimp in fishponds. The shrimp, \underline{P} . $\underline{monodon}$, is now being cultivated in Philippine estuarine fishponds together with small varieties of shrimp and milkfish (Chanos chanos). \underline{P} . $\underline{monodon}$ is considered to be a delicacy and commands the highest prices in the markets. The abundant supply of immature \underline{P} . $\underline{monodon}$ found all over the Philippines where milkfish fry are caught makes the development of pond rearing of shrimp a promising enterprise.



Portugal

CANNED FISH PACK, JANUARY-AUGUST 1955: The pack of canned sardines in oil or sauce for January-August 1955 amounted to 13,417 metric tons (net weight). The August 1955 pack was 4,105 tons as compared with 5,592 tons in August 1954.

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CANNED FISH EXPORTS, JANU-ARY-OCTOBER 1955: Portuguese canned fish exports totaled 7,931 metric tons (417,400 cases), valued at US\$3.6 million, during October 1955; and 50,702

tons, valued at US\$25.3 million, during January-October 1955.

Portuguese Canned Fish Pack, Jan,-Aug, 1955					
Product	Net	Canner's			
1 Todact	Weight	Value			
	Metric	1,000			
	Tons	US\$			
Sardines in brine	633	96			
Sardines in olive oil or sauce	13,417	7,453			
Sardinelike fish in brine	1,605	482			
Sardinelike fish in oil	2,552	1,404			
Anchovies, rolled & fillets	924	982			
Tuna in brine	69	33			
Tuna in olive oil	796	653			
Tunalikefish in olive oil	83	52			
Other species (including shellfish)	522	276			
Total	20,601	11,431			
Note: Values converted to US\$ equival	ent on the	e basis of			
28 75 escudos emial IIS\$1					

Portugal's export of canned fish in October 1955 maintained the high level of previous months, according to Conservas de Peixe, January 1955. During January-October 1955 Germany continued as the leading receiver with US\$4.5 million of canned fish (about all sardines in oil), followed by Italy with US\$4.1 million (principally sardines and tuna), Great Britain with US\$3.5 million, and the United States with US\$3.0 million (principally 2,692 tons of sardines in oil or sauce, 15 tons of tuna and tunalike fish in oil, and 1,469 tons of anchovies). Exports of canned fish to these 4 countries of canned fish to the first to the first

Portuguese Canned Fish Exports, October 1955 and Comparisons					
Species	Oct,	Oct. 1955 JanC			
	Metric	1,000	Metric	1,000	
	Tons	US\$	Tons	US\$	
Sardines in olive oil	6,781	2,920	40,744	19,511	
Sardinelike fish in olive					
oil	439	394	3,924	2,709	
Sardines & sardine-					
like fish in brine	237	50	1,732	345	
Tuna & tunalike in olive oil	118	82	1,889	1,387	
Tuna & tunalike in brine	31	17	576	292	
Mackerel in olive oil	263	153	1,303	787	
Other fish	62	27	534	286	
Total	7,931	3,643	50,702	25,317	

ports of canned fish to these 4 countries amounted to 57.1 percent of the total exports.

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FISHERIES TRENDS, OCTOBER 1955: Sardine Fishing: The catch of the Portuguese sardine fleet declined in October 1955 to 10,779 metric tons, or about 33 percent less than the September 1955 catch and only one-half of the catch of 21,965 tons reported for October 1954. The October 1955 sardine catch was valued at US\$1.4 million ex-vessel as compared with US\$1.7 million in September 1955.

The sardine canning industry absorbed 50 percent (5,368 tons) with the balance consumed fresh. The port of Matosinhos lead all others with a catch of 7,575 tons of sardines and contributed 4,181 tons (ex-vessel value US\$587,860) to the canning trade.

Other Fishing: The landings of fish other than sardines totaled 1,924 tons, valued at $\overline{US\$95,500}$ ex-vessel. The catch of fish other than sardines was 95 percent chinchards (1,828 tons), followed by mackerel (44 tons), anchovy (30 tons), and tuna (21 tons), the January 1956 Conservas de Peixe reports.

Spain

VIGO FISHERIES TRENDS, DECEMBER 1955: Fishing: In December the fishing industry in the Vigo area of Spain regularly enters into the dull winter season. Activities were reduced and catches were down from the preceding month. Weather was variable and part of the time the smaller boats fishing nearby waters were in port. Catches of agujas or alcriques (needlefish), used as a substitute for sardines for local consumption, were relatively good as were those of jurel (horse mackerel) and pescadilla (small hake). Sardine catches off Portugal were fair for December but other catches were small, states a January 20 dispatch from the United States Consul at Vigo. The ex-vessel price for sardines was US\$0.161 a pound as compared with about US\$0.097 in December 1954.

<u>Fish Canning</u>: The canning industry processed needlefish and available sardines and anchovies during the month, but worked at far below capacity. Since the canning industry is dependent upon the fishing industry, it is also entering on a slack period which will last until March or April. During the month the canning industry took only 1.4 million pounds or about 16 percent of the total catch, as compared with 3.7 million pounds (30 percent of the total catch) in November 1955 and 3.2 million pounds (18 percent of the total catch) in December 1954.

NEW TYPE COD FISHING VESSEL: A new type of Spanish fishing vessel for the cod fishery off Newfoundland is being constructed in a Portuguese shipyard, according to Dansk Fiskeritidende (February 10, 1956), a Danish trade paper. While the vessel is to be only 33 feet longer than the usual German or English distantwater trawler, it will carry a crew of 96. A 830 hp. motor will give the vessel a speed of 10.5 knots. Freezing equipment and a liver-oil plant will be installed forward. Eleven dories will be carried for line-fishing, and also two aluminum motor lifeboats. The motor lifeboats will tow the dories to the fishing grounds and transport the catch back to the mothership which, meanwhile, will be otter-trawling in suitable areas nearby.



Union of South Africa

FISH FLOUR EXPERIMENTS COMPLETED: The experiment on the manufacture of an odorless and nonfish-tasting flour made by the Fishing Industry Research Institute, Cape Town, to be used in bread and corn meal have been finished and the product has proved excellent, according to the Director of the Institute. The Institute is now endeavoring to perfect its product and reduce the cost so that it could be made on a commercial scale, states a February 7 dispatch from the United States Consul General in Cape Town.

The Institute's Director states: "It is a simple matter to reduce the odor and taste of fish, but only extensive research has made it possible to do this as well as retaining the fish protein in a digestible form. South Africa's main food scarcity is protein, and the addition of fish flour to bread not only means an increase in protein in the bread but enhances the biological value of the protein already in it."

It was also reported that the Institute has been requested by the Department of Nutrition of the Union's Ministry of Health to produce small quantities of fish flour for commercial- or consumer-acceptability tests to be carried out by that Department. These tests will get under way in the present fishing season as soon as enough maasbankers (Trachurus trachurus) are caught to provide 50 tons for processing into flour and subsequently bread and corn meal.

Note: Also Commercial Fisheries Review, March 1986, pp. 48-49.

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JACK MACKEREL CATCH LOW IN JANUARY-FEBRUARY 1956: Jack mackerel (maasbanker) catches in January and February 1956 off the South African west coast have been well below catches in previous years and are said to have hit a record low. It is estimated by reliable sources here that the value of these catches will be about US\$168,000 and US\$350,000 less than the value of catches during the same months in 1955 and 1954, respectively.

According to unofficial figures supplied the Director of Fisheries in Cape Town by fish factories on the South African west coast, only about 2,000 metric tons of fish were landed in January this year as compared to 4,700 tons in January 1955 and 25,000 tons in January 1954.

Indications are that catches in February 1956 will not be much better than those of the previous month. During February 1955 15,000 tons of jack mackerel reportedly were landed; in February two years ago, 17,500 tons.

The jack mackerel is South Africa's principal fishery at this time of the year, there has been considerable concern in the Union's fishing industry over the unexpected and rather unusual drop in catches of this fish during January and February.

The Secretary of the South African Fish Canners' Association in Cape Town considers the shortage of jack mackerel this year as "terrific" and stated that in his opinion the Union's 1956 jack mackerel catch "might just as well be written off the books." He added however, that fortunately there was an abundance in Union waters of small-size jack mackerel which would be harvested January, February, and March 1957.

It is understood also from the Secretary of the South African Fish Canners' Association that the Food Canning Workers' Union in Cape Town has requested the assistance of his organization in effecting the establishment of a provident fund for the benefit of unemployed cannery workers here in slack seasons or in times of abnormal unemployment, such as in the present case. The Union has proposed that this fund be established by joint contributions of employers and employees and that it be administered by a joint committee representing the interests of both employers and the Union. According to the Secretary of the Food Canning Workers' Union, social security benefits of some type are needed urgently by cannery workers in the Union as the fish industry, because of its very nature, cannot offer such workers full-time employment throughout the year.

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LOW DOMESTIC FISH MEAL PRICE HURTS BYPRODUCTS INDUSTRY: One of the problems of the Union of South Africa's huge fish-meal industry has nothing to do with the availability of fish or with the demand for its products. For years a Government regulation has forced it to meet demand from South African farmers at a fixed price which today is about half the price paid for the same meal on world markets. The industry would not object to selling on the local market and to meeting local demand at a reasonable price.

The industry last year produced more than 92,000 metric tons of meal of which about 40,000 tons had to be sold in the Union and South-West Africa at only US\$84 a ton. Thus a vital animal feed is made available to farmers at a price little higher than for the average fertilizer.

The fishing industry regards this price as completely unrealistic. It was bad enough when exported meal was earning about US\$140 a ton. The present price overseas is high and the demand is apparently unlimited, The South African Shipping News and Fishing Industry Review of January 1956 points out.

The industry now covers local needs first, supplying all the white-fish meal and fish meal required by Union farmers for supplementing stock feeds. But this service is performed at what the industry must regard as sub-economic prices for its meal. While farmers, already heavily subsidized, are earning good prices for their produce, the fishing industry has to subsidize them further by selling them its fish meal at a price far below that obtaining on world markets, the industry members point out.

Fish meal is produced by 13 factories on the Cape west coast and by 6 factories in South-West Africa and its sale and distribution is well organized on a pool system by the South African Fish Meal Producers' Association (Pty.) Ltd.

Under this system the Association is the selling channel functioning as a manufacturers' cooperative. Producers receive the average of the home market and export prices less costs, and the flow of the meal abroad is facilitated by selling most of the output of Union factories in South Africa and exporting the meal from the Walvis Bay factories.

Unfortunately, while this simplifies the problem of distribution, it does create a shipping problem for the Association. Because of inadequate facilities at the port of Walvis Bay, ships tend to avoid it and it is difficult at times to find space for exports.



REGULATION OF PACIFIC SALMON FISHING PLANNED: Further measures have been taken by Soviet Russia to protect the salmon resources in certain international waters of the North Pacific. The intention to regulate and control salmon fishing was announced in a radio broadcast from Moscow on February 10, 1956. Another unofficial radio announcement on March 21 stated that salmon fishing in the area of the entire Okhotsk Sea, the western portion of the Bering Sea, and the Northwest Pacific will be restricted between May 15 and September 15, 1956.

A ruling by the Soviet Council of Ministers declares that permits from the Soviet Ministry of Fisheries will be necessary before salmon can be taken from these waters. The measures are aimed at Japanese fishermen whose netting of salmon during the spawning season has been described by the Soviet press as a threat to the economy of Soviet Siberia. The ruling makes clear that it intends to regulate salmon fishing in the open sea, as well as in Soviet territorial waters, but does not affect the freedom of navigation in the areas concerned.

The regulations will restrict the catch to 50,000 tons or about 25 million fish. In addition to issuing permits, the Soviet authorities will inspect and control fishing in the area. The ruling makes clear that the ban on fishing would apply only until an agreement with the other countries concerned is reached for the protection of the salmon resources. Since Japan is the chief country concerned with this salmon fishery, an agreement would be difficult to reach because of the lack of diplomatic relations between Japan and Soviet Russia.

The Japanese fishing industry has made plans to send 19 fishing fleets to the North Pacific this year, an increase of five over the 1955 fleet. Tentative plans have been made for a catch target of 100 million salmon and trout. The target for red salmon alone was set at 30 million fish.

The Japanese fishing industry is alarmed at the proposed regulations and it may be necessary for the Japanese Government to grant permission for the private fishing interests to negotiate with Soviet Russia.



United Kingdom

TRAWLERS USE "GROUP-OF-THREE" SYSTEM TO IMPROVE QUALITY: Six British trawlers based at Milford Haven initiated a "shuttle" service in order that their catches will never be more than nine days old when landed. These vessels have been engaged in the normal "pair" fishing using the Spanish "pareja" system.

The "group-of-three" system has been used very successfully by Spanish fishing vessels, but the Milford Haven scheme will be the first time it has been introduced in Britain, according to the January 30 issue of The Fishing News, a British weekly periodical.

The Ministry of Agriculture and Fisheries is so impressed by the prospect of much fresher fish being landed that a special clause has been introduced into the new White Fish Authority subsidy scheme. This will bring the "groups of three" boats into line with the bigger hake trawlers for subsidy purposes. At present they are classed under the North Sea fishing subsidy scheme.

The first two ships will go out to fish as a normal "pair." A week later, a third boat will sail to "relieve" one of the original pair, to which all the fish then caught by the "pair" will be transferred. The relieved ship will bring the total catch back to port and the other two ships will continue fishing until the second vessel is relieved a week later by the ship that originally returned to port. By this method catches which up till now have been landed after a 14- to 16-day "pair" trip will now be brought back every week by the third trawler.

In practice, as far as the crews are concerned, the "group-of-three" system will mean a minimum of three days ashore every 17-18 days. If a "pair" sail on a Thursday, fishing would normally commence on Saturday morning. The ship to be relieved leaves the grounds for home on the following Friday night to land for Monday's market. Her crew would then be ashore until Thursday morning. The third ship which has to be "on station" ready for Saturday morning's fishing operations, would have left Milford on the previous Thursday morning to rendezvous with the second ship on the fishing grounds. Thus a continuous "shuttle" service will be maintained and crews will get longer time ashore between voyages.

The main object of the "group-of-three" plan is to bring in fish, and hake in particular, in better, fresher condition and to maintain a regular fishing "cycle" and steadier supplies.

Milford Haven has led Britain's fishing industry in the introduction of the "pair" fishing system, which has in the past given the port some of its highest-yielding hake trips.

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<u>WHALING INDUSTRY</u> <u>REGULATIONS AMENDED</u>: Recent changes in the Whaling Industry Act revoke and re-enact with amendments the 1953-55 Regulations, and give effect to certain resolutions of the International Whaling Commission. The principal changes are:

- "1. Prohibiting the killing of blue whales in the Antarctic before February 1 in any year..."
- "2. Reducing to 15,000 the total number of blue whale units that may be taken in any year in waters south of 40 degrees south latitude by catchers attached to factoryships of the powers bound by the resolutions of the Commission;
- "3. Requiring the return of daily statistics of whales taken after the catch is deemed by the Bureau of International Whaling Statistics to have reached 13,500 whale units."



Venezuela

 $\frac{\text{TUNA SHIPPED TO THE UNITED STATES:}}{\text{Botween 70 and 80 metric tons of frozen tuna caught in the Caribbean Sea off Venezuela by the Japanese long-liner}\\ \frac{\text{Bozo Maru}}{\text{administrator of the Customs at Guanta.}}$ This report appeared in the February 16 issue of $\underline{\text{El Nacional}}$.

The Japanese long-liner, said to be commissioned by the Japanese Ministry of Agriculture and Forests, is supervised by Dr. G. Shinsuke Itoh. The vessel, which has been operating off the Venezuelan island of La Blanquilla for several months, is reported owned by a Venezuelan national.

Dr. Shinsuke is reported to have stated that the size of Venezuelan tuna is equalled only by those off the North African coast. Fish of 90 pounds each are common and those of 100 to 130 pounds each are not rare. He expects a catch of 400 tons monthly.

Fresh tuna has been offered on the Caracas market but has found few buyers, a February 16 United States Embassy dispatch from Caracas states. Few in Venezuela are familiar with other than canned tuna.

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<u>USE OF SARDINES FOR REDUCTION PROTESTED</u>: Recently a well-known fish canner and spokesman for the Venezuelan fishing industry protested publicly to the Venezuelan Government regarding the use of sardines for the manufacture of fish meal. He claims that the sardines that inhabit the Gulf of Cariaco are needed by the canners for human food and for employment of many Venezuelan workers, a March 1 dispatch from the United States Embassy in Caracas states.



COOPERATIVE WILDLIFE RESEARCH UNIT SCHOOLS BESTOW 2,373 DEGREES

A total of 17 colleges affiliated with the Cooperative Wildlife Research Program have bestowed 2,373 degrees upon wildlife students since the program started in 1935, Acting Secretary of the Interior Clarence A. Davis said March 23. Compilations recently made by the Fish and Wildlife Service show that there were 186 degrees issued by these colleges and universities in the school year 1954-55. Of these, eight were doctorates, 63 master's degrees, and the rest bachelor degrees.

The Cooperative Unit Program is sponsored jointly by the Fish and Wildlife Service, the State conservation departments and land grant colleges of 15 States and Alaska, and the Wildlife Management Institute. Each unit has a minimum budget of \$18,000 a year for salaries and facilities.

The primary purposes of the cooperative program are to encourage the training of personnel for wildlife management; to conduct wildlife research; and to promote wildlife education.

During the calendar year 1955 there were 275 research programs conducted, of which 48 were concerned with migratory waterfowl, 49 with fisheries, and the others with studies of wildlife species, habitat, and management problems. There were 161 articles, ranging from leaflets to books, prepared and published by unit personnel.

Of the 186 whoreceived degrees in 1955, 82 have wildlife jobs with Federal, State and private organizations; 44 have entered the armed forces; 36 have returned to school for advanced training; and 24 are in occupations other than wildlife work.

Forty-eight of the 71 students who received advanced training last year obtained financial assistance in the form of fellowships, scholarships, or field expenses from the Cooperative Units. In addition, one-fifth of those who received bachelor degrees had financial support from the Cooperative Unit or used Unit equipment.



Department of the Interior FISH AND WILDLIFE SERVICE

ALASKA COMMERCIAL FISHING REGULATIONS REVISED:

Extensive revisions of the annual commercial fishing regulations for the 1956 season in Alaska were announced March 19 by the U.S. Department of the Interior. The regulations will be effective 30 days after publication in the Federal Register.



Salmon trollers off Ketchikan, Alaska.

Although most of the revisions were characterized by the Acting Secretary as "noncontroversial," he emphasized that five important changes will be in effect during the 1956 season. These he listed as follows:

- Registration and limitation of fishing boats to one operating area to be selected by the operator;
- 2. Control of fishing on the high seas off the Alaska coast by United States nationals;
- Limitation on the days per week of fishing in the Bristol Bay area, depending upon the number of units of gear operating;

- 4. Temporary closure during 1956 of 15 trap sites in the Prince William Sound area; and
- 5. Continuation during 1956 of the pink salmon restoration program in south-eastern Alaska involving temporary closure of traps accounting for 50 percent of the trap catch of the area, and closure of extensive seine areas in the immediate vicinity of important salmon streams.

The last three changes which refer only to fishing in territorial waters are incorporated in the revised regulations announced March 19. At the same time the U. S. Fish and Wildlife Service issued a "notice of intention" concerning the other two items. This was done to put the industry and fishermen on notice that such regulations would be issued at a later date, to be effective in 1956. Since these changes represent radical departure from established procedures in regulating the Alaska commercial fisheries, more time is required by the Service for study and review before issuance.

The first of these new regulations—so—called "area licensing"—will deal with limitation as to place of operation by fishing boats in Alaskan waters. Although previously untested in Alaska, this has been under study for the past five years and has been discussed at public fisheries hearings in Alaska and Seattle, Wash. Authorities on fisheries management concede that area licensing offers the most promise in solving the problem of spreading the fishing effort so that the proper balance between escapement and catch is maintained.

The second proposed regulation, designed to control fishing by United States nationals on the high seas of the North Pacific Ocean and Bering Sea adjacent to Alaskan waters, awaits the consideration and approval of the American sec-

tion of the North Pacific Fisheries Commission. The Commission has requested such a regulation. The purpose of the regulation is to prevent development of an American high-seas salmon fishery which would intercept the Alaskan salmon runs before they reach waters now under regulation. It has been demonstrated that salmon can be taken in commercial quantities on the high seas to such an extent that protective measures imposed within territorial limits could be nullified.

The proposed limitation on fishing time in Bristol Bay is somewhat different than it has been in the past. This year the U.S. Fish and Wildlife Service has included in the regulations a table showing the allowable number of days fishing each week with varying numbers of units of gear in operation. This will permit the operators to make more orderly plans for consolidation so as to tailor their operations to the number of fishing days per week they desire. The regulations will require registration of drift and set nets to be operated in each district 30 days before the fishing season opens by 6 p.m. Friday for the following week and each week thereafter.

Prince William Sound, which has been closed to pink salmon fishing for two years, will reopen this year. The operators have voluntarily offered to surrender 15 trap sites for 1956 which otherwise would be fished. Since this closure is in the interest of conservation and is similar, although less drastic than the trap-curtailment program in southeastern Alaska, it has been incorporated into the regulations for 1956.

The U.S. Fish and Wildlife Service reports that definite gains have been achieved by the restoration program imposed on the southeastern Alaska pink salmon fishery in 1954 and 1955. The spawning escapements in both years were better than in the parent years but still not adequate to restore the runs fully. There is almost unanimous agreement that the restoration program should be continued at least through 1956.



Interstate Commerce

Commission

FREIGHT-RATE INCREASES GRANTED:

The Interstate Commerce Commission granted another round of increases in freight rates in March 1956 to help the carriers meet increased wages and other operating costs. Early in 1956 the railroads filed a petition for a 7-percent increase and almost all other carriers



joined in the request. After hearings in the railroads' case, the I.C.C. granted a 6-percent increase in rail freight except for canned foods. The new rates for canned foods, including fish, were limited to a maximum of 6 cents a pound or about 3 to 4 percent.

Table 1 - Example of Freight Rates Per 100 Pounds of Fresh or Frozen Fish				
	Before Increase	After Increase		
Any Pacific Coast Railroad Terminal to New York City or Boston Any Pacific Coast Railroad Terminal	\$3,16	\$3,35		
to Chicago	2.01	2,13		

Shortly thereafter the I.C.C. permitted for certain areas west of the Mississippi River a truck rate increase of 6 percent to go into effect without hearings, although many protests were filed.

Table 2 - Example of Freight Rates Per 100 Pounds of Canned Fish				
	Before Increase	After Increase		
Any Pacific Coast Railroad Terminal to New York City or Boston Any Pacific Coast Railroad Terminal	\$1,76	\$1,82		
to Chicago	1.49	1,55		

The effective date of most of these increases was March 7. No increases were granted in carload refrigeration charges. Furthermore, the 15-percent increase in refrigeration charges recently granted the railroads, after a two-year fight, have not yet been published. Petitions have been filed with the I.C.C. seeking postponement and reconsideration of their decision.

The Railway Express Agency asked the Commission for a 7-percent increase effective March 20, but only for its firstand second-class rates. In addition, the increase would apply on return insulated containers and C.O.D. charges. effective April 2. No increase has been requested at this time on commodityrate traffic, minimum charges therefor, or re-icing charges.



White House

CANNED TUNA IN BRINE IMPORT DUTY ADJUSTED:

An increase in the import duty of canned tuna in brine from 121 percent to 25 percent ad valorem for such imports exceeding 20 percent of the pre-

vious year's United States pack of canned tuna is provided for in a Presidential proclamation signed March 16, 1956.

The proclamation gives effect to an exchange of notes with Iceland which with-



draws tuna canned in brine from the 1943 trade agreement with that country and to an invocation of the right reserved by the United States in the General Agreement on Tariffs and Trade to increase the duty on tuna canned in brine.

In any calendar year the increased duty would apply only to those imports in excess of the stated 20 percent and only for the remainder of that year. Imports in any year up to the 20-percent breakpoint would be subject to the $12\frac{1}{2}$ percent ad valorem rate. Because the President's proclamation will become effective on April 14, 1956, it provides that the increased rate of duty will apply this year if and when imports of tuna canned in brine after the April 14 date exceed 15 percent of last year's domestic pack of canned tuna. The quantity of

tuna canned in brine which may enter in 1956 after April 14 at the reduced rate of duty is estimated to be about 28,757,000

In the 1955 trade agreement negotiations involving Japan's accession to the General Agreement on Tariffs and Trade, the United States agreed not to increase the existing rate of $12\frac{1}{2}$ percent ad valorem applying to imports of tuna canned in brine, subject to the reservation of a right to impose a higher rate of duty on imports in any calendar year in excess of 20 percent of the domestic pack of canned tuna during the preceding year. This reservation has now been invoked.

Because annual imports of tuna canned in brine are not at present amounting to 20 percent of the domestic tuna pack, no immediate application of the increased duty will follow upon the President's action, a March 17 news release from the White House announces.

During the calendar year 1955, imports of tuna canned in brine totaled 34 million pounds. These imports were about 18 percent of the United States pack of canned tuna as reported by the U. S. Fish and Wildlife Service. The United States pack includes Puerto Rico and Hawaii, but excludes American Samoa.

In the 1943 trade agreement with Iceland, the United States reduced the duty on certain miscellaneous canned fish which were not packed in oil or in oil and other substances, dutiable under tariff paragraph 718(b) of the Tariff Act of 1930, as amended. This concession was intended primarily to cover certain specialty canned fish produced in Iceland. When tuna canned in brine became an article of trade, United States imports were classified under the item of Paragraph 718(b) subject to the reduced rate of the Icelandic agreement.

Tuna canned in brine is a relatively new product, its production being stimulated to take advantage of the lower rate of the Icelandic concession and particularly in response to the change in duty on tuna canned in oil from $22\frac{1}{2}$ percent to 45 percent at the termination of the Mexican trade agreement effective January 1, 1951. There is very little domestic production of tuna canned in brine.

In the 1955 trade agreement negotiations with Japan and other countries under the General Agreement on Tariffs and Trade, the United States agreed not to increase the existing rate of $12\frac{1}{2}$ percent ad valorem applying to imports of tuna canned in brine subject, however, to a reservation of the right to impose a higher rate of duty on imports in any

TERMINATING IN PART THE ICELANDIC TRADE AGREEMENT PROCLAMATIONS AND SUPPLEMENTING PROCLAMATION NO. 3105 OF JULY 22, 1955

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

1. WHEREAS, under authority of section 350(a) of the Tariff Act of 130, as amended, the President on August 27, 1943, entered into a trade agreement with the Regent of Iceland, including two schedules annexed thereto (57 Stat. 1)76), and by proclamation of September 30, 1943 (57 Stat. 1075), he proclaimed the said trade agreement, which proclamation has been supplemented by proclamation of October 22, 1943 (57 Stat. 1098).

WHEREAS item 718(b) of Schedule II of the said trade agreement reads as follows:

'United States Tariff Act of 1930 Paragraph	Description of Article	Rate of Duty
·718(b)	Fish, prepared or preserved in any manner, when packed in air-light containers weighing with their contents not more than fifteen pounds each (except fish packed in oil or in oil and other substances): "Any of the foregoing (except herring. "Any of the foregoing (except herring. smoked or kippered or in tomato sauce, packed in immediate containers weighing with their contents more than one pound each, and except salmon and anchovies)	12 1/2% ad valorem

3. WHEREAS the Government of the United States and the Government of Iceland by an exchange of notes dated March 5 and 6, 1956, have agreed to the withdrawal, effective April 14, 1956, of tuna from said item 718(b), with the result that the said item shall thereafter read as follows:

United States Tariff Act of 1930 Paragraph	Description of Article	Rate of Duty
718(b)	Fish, prepared or preserved in any manner, when packed in airtight containers weighing with their containers weighing with their pounds each (except fish packed in oil or in oil and other substances; except herring, smoked or kippered or in tomato sauce, packed in immediate containers weighing with their contents more than one pound each; and except salmon, anchovies, and tuna)	12 1/2% ad valorer

4. WHEREAS, under the authority of the said section 350(a) of the Tariff Act of 1930, as amended, the President on June 8, 1955, entered into a trade agreement providing for the accession of Japan to the General Agreement on Tariffs and Trade, which trade agreement consists of the Protocol of Terms of Accession of Japan to the General Agreement, including Schedule XX contained in Annex A thereto, and by Proclamation No. 3105 of July 22, 1955 (20 F.R. 5379), he proclaimed the said trade agreement, which proclamation was supplemented by a notification of August 22, 1955 from the President to the Secretary of the Treasury (20 F.R. 6317).

WHEREAS item 718(b) in Part I of the said Schedule XX reads as follows: year in excess of 20 percent of the previous year's domestic pack.

The withdrawal of this item from the Icelandic agreement in no way affects the concession granted on other fish items of primary interest to Iceland. United States imports of tuna canned in brine in 1955 came principally from Japan, other suppliers were Peru, Azores, Portugal, Angola.

"Tariff Act of 1930 paragraph	Description of Products	Rate of Duty
''718(ъ)	Fish, prepared or preserved in any manner, when packed in air-tight containers weighing with broids containers weighing with broids containers weighing with broids coll or in oil and other substances; "Tuna." "NOTE: The United States reserves the right to increase the rate of duty on fish of the foregoing description which are entered in any calendar year in excess of an aggregate quantity equal to 20 per centum of the United States pack of canned tuna fish during the immediately preceded by the United States pack of canned tuna fish during the immediately preceded by the United States Fish and Wildlife Service."	12-1/2% ad val.

6. WHEREAS on March 16, 1956 the Government of the United States notified the Executive Secretary to the CONTRACTING PARTIES to the General Agreement on Tariffs and Trade that it invoked the reservation contained in the note to the said item 718(b) set forth in the fifth recital of this proclamation, effective April 14, 1956; and

7. WHEREAS the first general note to the said Schedule XX specified in the fourth recital of this proclamation provides that the provisions of that schedule are subject to the following general note to Schedule XX to the General Agreement on Tariffs and Trade, of October 30, 1947 (6) Stat. (pt. 5) Al352):

"4. If any tariff quota provided for in this Schedule, other than those provided for in items 771, becomes effective after the beginning of a period specified as the quota year, the quantity of the quota product entitled to enter under the quota during the unexpired portion of the quota year shall be the annual quota quantity less 1/12 thereof for each full calendar month that has expired in such period.":

NOW, THEREFORE, I, DWIGHT D. EISENHOWER, President of the United States of America, acting under and by virtue of the authority vested in me by the Constitution and the statutes, including the said section 350 of the Tariff Act of 1930, as amended, do proclaim as follows:

Part I

In accordance with the exchange of notes specified in the third rectial of this proclamation, thereby terminate in part the proclamations of September 30, 1943, and October 22, 1943, referred to in the first rectial of this proclamation, insofar as such proclamations apply to tuna provided for in the said item 718(b) set forth in the second rectal of this proclamation, such termination to be effective at the close of business on April 14, 1956, with the result that the rate of duty specified in the said item 718(b) shall thereafter apply only to the articles provided for in the said item 718(b) shall thereafter apply only to the of this proclamation.

Part II

In accordance with the notification specified in the sixth recital of this proclamation I hereby terminate in part, effective at the close of business on April 14, 1956, the said proclamation of July 22, 1955, and the said notification of August 22, 1955, referred to in the fourth recital, insofar as such proclamation and notification apply to tuna provided for in the said item 718(b) set forth in the fifth recital which are entered, or withdrawn from warehouse, for consumption in the

calendar year 1956 after April 14, 1956 in excess of an aggregate quantity equal to 15 per centum of the United States pack of canned tuna during the calendar year 1955, as reported by the United States Fish and Wildlife Service, and in any calendar year after 1956 in excess of an aggregate quantity equal to 20 per centum of the United States pack of canned tuna fish during the immediately perceding calendar year, as so reported, with the result that such tuna in excess of such 15 or 20 per centum of the United States pack shall be dutable at 25 per centum ad v_lorem, the full rate provided for in paragraph 718(b) of the Tarilf Act of 1930 (46 Stat, (p. t.) 633).

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this sixteenth day of March, in the year of our Lord masteen hundred and fifty-six, and of the Independence of the Molecular States of America the one hundred and eightletic

DWIGHT D. FISENHOWER

By the President:

Herbert Hoover, Jr.

Acting Secretary of State,



Eighty-Fourth Congress (Second Session)

Listed below are public bills and resolutions that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber actions on the bills shown are published; and if passed, they are shown when signed by the President.

GREAT LAKES FISHERIES TREATY: S. 3347 (Thye, Potter, and Wiley) introduced in the Senate March 14, a bill to give effect to the Convention on Great Lakes Fisheries signed at Washington, September 10, 1954, and for other purposes; to the Committee on Interstate and Foreign Commerce.

Also S. 3524 (Magnuson) introduced March 23_i and H_{\bullet} R_{\bullet} 9951 (Bonner), H_{\bullet} R_{\bullet} 9958 (Davidson), H_{\bullet} R_{\bullet} 10,001 (Rabaut), all introduced March $\overline{15_i}$ all similar to S. $\overline{3347_{\bullet}}$

TRANSPORTATION TAX EXEMPTION FOR CERTAIN FISHERY PRODUCTS: H. R. 9912 (McCarthy) introduced in the House March 13, 1956; a bill to exempt certain livestock, fish (including shellfish), and agricultural commodities from the tax on the transportation of property. The bill does not include manufactured products.

TRADE COOPERATION ORGANIZATION: House Committee on Ways and Means on March 26 ordered favorably reported, with amendments \underline{H} , \underline{R} , 5550, authorizing the President to accept membership on behalf of the United States in the Organization for Trade Cooperation,

TRUCK TRIP LEASING: Senate March 28 passed with amendments S. 898, to amend the Interstate Commerce Act with respect to the authority of the ICC to regulate the use by motor carriers of motor vehicles not owned by them, after adopting committee amendments, one with an amendment by Senator Magnuson exempting from certain regulation farmers' or cooperatives' trucks which are used regularly in transportation of processed or manufactured perishable products. The amendment provides that the trip-leasing benefits are available to a private carrier whose truck is used "regularly in the transportation of processed or manufactured perishable commodities of the character referred to in section 203(b)(6)," Section 203(b)(6) is the section of the Interstate Commerce Act that interprets the term agricultural commodities and exempts agricultural products, including livestock, poultry, and fish. So the amendment would extend the benefits of trip leasing to private carriers who transport processed or manufactured perishable products from agricultural commodities, livestock, fish, or poultry. In other words, a private carrier who uses his equipment regularly to haul dressed poultry, dressed meat, milk, butter, fish or similar perishables processed or manufactured from agricultural commodities could trip lease home in accordance with the provisions of the bill. The Interstate Commerce Commission about 5 years ago indicated that it would not permit the practice of trip leasing to continue, and it issued order MC-43, which provided that as of a certain date trip leasing would not be permitted unless the person who trip leased his truck to a particular carrier did so for a period of 30 days or more. S. 898 sets aside this ICC order.



DRYING FISH BY INFRARED LAMPS

The Experimental Fisheries Station, Tateyama, Japan, has been using batteries of infrared lamps to dry fish at 40° to 45° C. (104°-113° F.). The drying takes two hours and can be accelerated by circulation of air. The final product is said to be free from odors produced by the conventional methods.

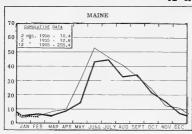
-- Industria Conservera, April 1953.



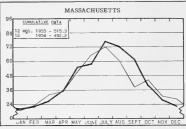


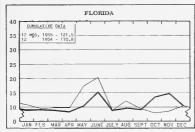
CHART I - FISHERY LANDINGS for SELECTED STATES

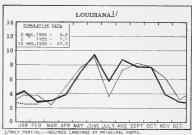
In Millions of Pounds

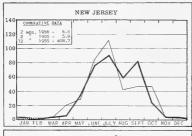












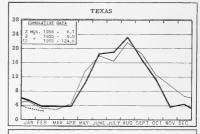
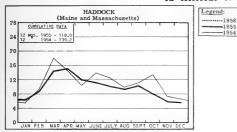


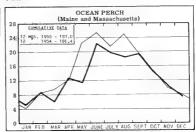




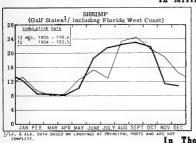
CHART 2 - LANDINGS for SELECTED FISHERIES

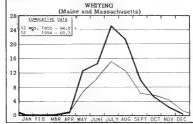
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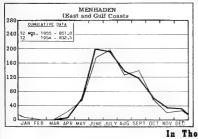


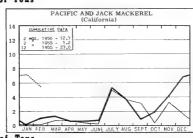
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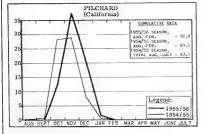


In Thousands of Tons





In Thousands of Tons



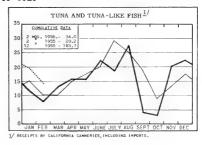
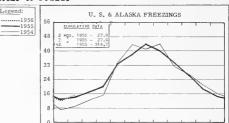
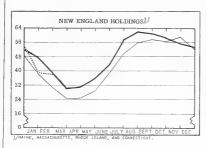


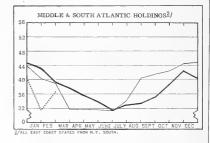
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

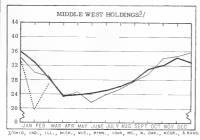


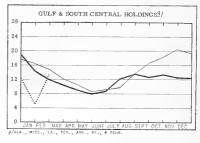


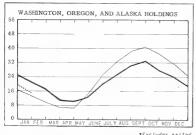






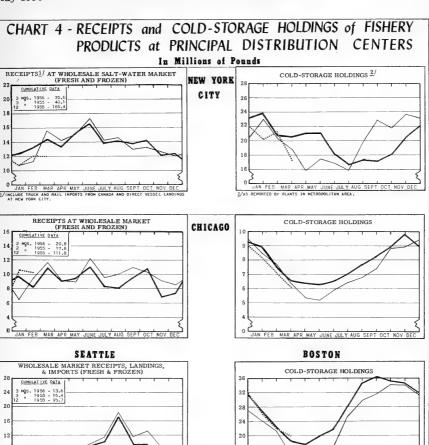


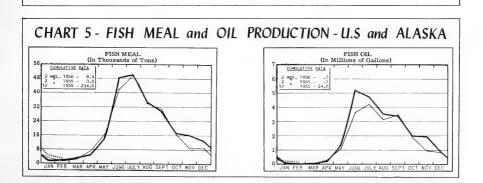






*Excludes salted, cured, and smoked products.





Legend:

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV

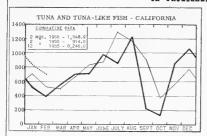
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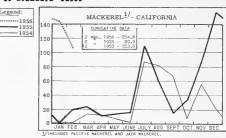
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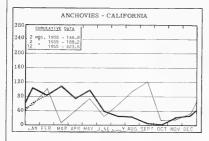
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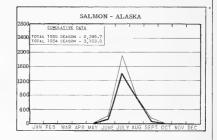
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

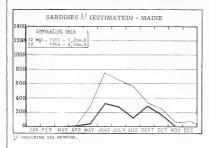
In Thousands of Standard Cases



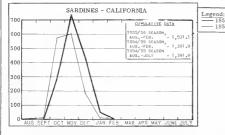








STANDARD CASES								
Variety								
variety	No. Cans	Can Designation	Net V	gt.				
SARDINES	100	1/4 drawn	31/4	oz.				
SHRIMP	48	~ ~	5	oz.				
TUNA	48	No. ½ tuna	6 & 7	oz.				
PILCHARDS	48	No. 1 oval	15	oz.				
SALMON	48	1-pound tall	16	oz.				
ANCHOVIES	48	$\frac{1}{2}$ lb.	8	oz,				
1								



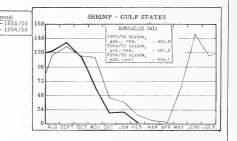
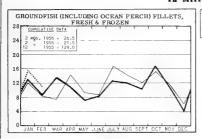
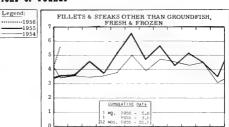
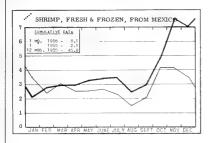


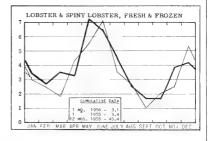
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

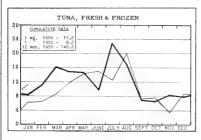
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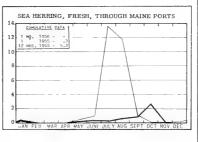


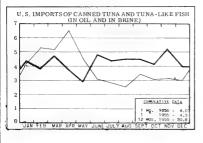


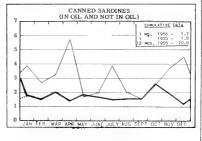














FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA.
- FISHERY LEAFLETS ΕL

STATISTICAL SECTION LISTS OF DEALERS IN AND PRO-SL

SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRO DUCERS OF FISHERY PRODUCTS AND BYPRODUCTS, SSR, - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION), SEP, - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1267 - Alabama Landings, November 1955,

CFS-1270 - New Jersey Landings, December 1955. 2 pp.

CFS-1272 - Frozen Fish Report, January 1956, 8 pp.

CFS-1273 - Massachusetts Landings, November 1955, 5 pp.

CFS-1274 - North Carolina Landings, December 1955, 2 pp.

CFS-1277 - Mississippi Landings, December 1955, 2 pp.

CFS-1278 - Fish Meal & Oil, January 1956, 2 pp. CFS-1279 - New York Landings, December 1955, 4 pp.

CFS-1280 - Alabama Landings, December 1955, 2 pp.

CFS-1284 - Shrimp Landings, January 1956, 2pp. CFS-1285 - California Landings, October 1955, 4 pp.

CFS-1288 - North Carolina Landings, January 1956, 2 pp.

CFS-1289 - New Jersey Landings, January 1956, 2 pp. CFS-1299 - Maine Landings, January 1956, 3 pp.

FL - 432 - Fishery Statistical Publications of the Fish & Wildlife Service, 20 pp.

SL - 162 - Firms Producing Fish Sticks, 1955 (Revised), 2 pp.

SSR-Fish. No. 166 - Studies on an Ichthyosporidium Infection in Fish: Transmission and Host Specificity, by Paul V. Gustafson and Robert R. Rucker, 10 pp., illus., processed, January 1956.

SSR-Fish. No. 167 - Passage of Fission Products through the Skin of Tuna, by Walter A. Chipman, 9 pp., processed, February 1956.

SSR-Fish. No. 168 - Mid-Pacific Oceanography Part IX, Operation NORPAC, by J. W. McGary and T. S. Austin, 134 pp., illus., processed, January 1956.

Sep. No. 434 - Condition of the Middle Atlantic Pound-Net Fishery.

Sep. No. 435 - School Lunch Fish-Cookery Demonstrations in Oklahoma.

Sport Fishery Abstracts, vol. 1, no. 3, Abstracts 315-446, 52 pp. processed, January 1956.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D.C.

Fishery Publication Index, 1920-54, Circular 36, 264 pp., processed, \$1.50, 1955. This index describes the publications of the United States Bureau of Fisheries from 1920 to 1940 and fishery publications of the Fish and Wildlife Service from 1940 to 1954. The index is in three parts: (1) A serial list of the numbers issued in each publication series; (2) an alphabetical index of authors; and (3) an alphabetical index of subjects. A description of each publication series is also presented.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

Boston Fishery Products Monthly Summary, January 1956, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the month indicated.

Boston Fishery Products Monthly Summary, February 1956, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.)

California Fishery Products Monthly Summary, January 1956, 11 pp. Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. California cannery receipts of raw tuna and tunalike fish, sardines, herring, and squid; pack of canned tuna, mackerel, sardines, herring, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, Eureka, and San Diego areas; United States imports of fishery products into California and Arizona; cold-storage freezings and holdings of fishery products; canned fish and frozen shrimp prices at the primary or wholesale level; for the month indicated.

California Fishery Products Monthly Summary,
February 1956, 10 pp. Market News Service,
U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.

- (Chicago) January 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.
- (New York) Monthly Summary-December 1955 Receipts of Fishery Products at the New York
 City Wholesale Salt-Water Fish Market, 5 pp.
 (Market News Service, U. S. Fish and Wildlife
 Service, 155 John St., New York 38, N.Y.)
 Receipts in the salt-water section of the Fulton
 Fish Market by species and by states and provinces for the month indicated.
- Gulf Monthly Landings, Production, and Shipments of Fishery Products, January 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp landings, cyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.
- Gulf Monthly Landings, Production, and Shipments of Fishery Products, February 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.)
- Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, P. O. Box 447, Hampton, Va.) Fisheries production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.
- (Seattle) Monthly Summary Fishery Products, February 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers for the month indicated.
- The Flounder and Industrial Fishery Project, Interim Report, 4 pp., illus., processed. (Available free from the U. S. Fishery Laboratory, Fish and Wildlife Service, Woods Hole, Mass.) A brief report on a study of the complex mixed industrial fishery at Pt. Judith, including information on the species composition of the industrial catch, catch in pounds per hour of industrial species, catch per hour of food fishes, and population data.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT ISSUALLY MAY BE ORDINADE FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPE

- Achievements of the Directorate of Fisheries,

 East Bengal in the Field of Fish Culture, 12
 pp., illus., printed. Director of Fisheries,
 Government of East Bengal, Dacca, East Bengal, 1955.
- Alabama Laws and Regulations Relating to Game, Fish, and Fur-Bearing Animals, Season 1954-1955, 146 pp., printed. Division of Game and Fish, Department of Conservation, Montgomery, Ala.
- "Analysis of Phytoplankton Yields in Relation to Certain Physical and Chemical Factors of Lake Michigan," by Ruth E. Griffith, article, Ecology, vol. 36, no. 4, October 1955, pp. 543-552, illus., printed. Duke University Press, Box 6697, College Station, Durham, N. C.
- British Columbia Catch Statistics, 1955 (By Area and Type of Gear), 137 pp., illus., processed. Department of Fisheries of Canada, 1110 West Georgia St., Vancouver 5, B.C. The fifth annual report of fish-catch statistics for British Columbia based on Departmental copies of sales slips that are completed by all commercial fish buyers operating within the Province. Statistics are presented by species, months, gear, and area. This report is intended as a factual statement of catch and no attempt is made to explain the strength or absence of various runs or catches. However, a review of certain economic, weather, and conservation factors that have a bearing on catch are enumerated.
- Boletin Cientifico, vol. II (1955), 175 pp., illus., printed. Compania Administradora del Guano, Lima, Peru. Articles deal principally with oceanography off the Chilean and Peruvian coasts and Peru's guanobirds. One article discusses age and growth of the anchoveta, a bait fish.
- Bulletin Officiel D'Information du Conseil Superieur de la Peche, Number 22, October-December 1955, 106 pp., illus., printed in French.
 Conseil Superieur de la Peche, 1 Avenue de Lowendal, Paris, France.
- (Canada) Eighth Annual Report of the Fisheries
 Prices Support Board for the Year 1954-55,
 10 pp., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1955.
 Describes the Fisheries Prices Support Act; economic conditions of the British Columbia, Atlantic Coast, and fresh-water fisheries:

price support programs for bloaters and Atlantic Coast salted codfish; and research and other activities of the Board.

- "The Coelacanth," by Jacques Millot, article, Scientific American, vol. 193, no. 6, December 1955, pp. 34-39, illus., printed, single copy 50 cents. Scientific American, 2 West 45th St., New York 36, N. Y.
- "The Collapse and Recovery of a Small Whitefish Fishery," by Richard B. Miller, article, Journal of the Fisheries Research Board of Canada, vol. 13, no. 1, January 1956, pp. 135-146, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.
- (East Pakistan) Fish Wealth of East Pakistan, by Nazir Ahmad, 27 pp., illus., printed. Directorate of Fisheries, Government of East Bengal, Dacca, East Bengal. Describes the inland and marine fisheries of the Province of East Pakistan, fish culture, types of craft and gear used in the various fisheries, conditions of fishmarkets in East Bengal, and preservation and curing of fish.
- (East Pakistan) Report on the Fish and Fisheries of East Pakistan, by Nazir Ahmad, 16 pp., illus., printed. Director of Fisheries, Government of East Bengal, Dacca, East Bengal, 1955. This report (for official use only) describes briefly the fishery resources of East Bengal, fish culture, methods of capture, and fishery problems and their solution.
- (Ecuador) Primer Censo Nacional de Pescadores, 1954 (First National Census of Fishermen), by Censo Agropecuario Nacional por Muestreo (Coordinating and Supervisory Commission of the National Agricultural Census), 180 pp. illus., processed. Direccion General de Estadistica y Censos, Quito, Ecuador. The census of fishermen was prepared during 1954 and 1955 in cooperation with FAO experts and covers the entire seacoast of Ecuador, but excludes inland waters and the Galapagos Islands. Two basic questionnaires were used: (1) to ascertain information concerning fishing activities of individual families; and (2) to obtain information about species, prices, etc., within entire fishing communities. The results of the survey are summarized in 25 sets of tables and graphs, covering the number of family units engaged in fishing, types of vessels and implements used, time spent on expeditions, volume of catches, geographical distribution of "fishing zones," varieties of species found, seasonal variation in availability of each species, and sales in local and other markets. Figures are given by province, canton, and in some cases by community.
- An Evaluation of Nine Types of Commercial Fishing Gear in Kentucky Lake, by Ellis R. Carter, article, Transactions of the Kentucky Academy of Science, vol. 15, no. 3, October 1954, pp. 56-80, printed. Kentucky Academy of Science, Lexington, Ky. During experimental use of nine types of commercial netting equipment, in

- five representative areas of Kentucky Lake, 36 species of fish were taken, of which 15 were game and pan fishes, 16 were commercial species and 5 were forage and trashfishes. Of the nine types of equipment, hoop nets are easiest to use and took predominantly commercial species. Wing nets took more fish, numerically, than any other type, but the catch was 82.07 percent game and pan fishes. Any of the seven barrel-type nets used were more successful when constructed with two throats. Gill nets were inefficient in mesh sizes over 3 inches, and were selective for game fish in mesh sizes under 3 inches. Trammel nets were slightly more successful in taking commercial species. Wire baskets took the smallest fishes; however, 75.30 percent were game fish. Wood baskets produced the lowest average return per unit of effort, but harvested 79.5 percent commercial fishes. Heart-lead nets caught a greater total poundage and also more pounds per net day than any other type. Lead nets were the second most successful type. Both, however, were rather selective for game fishes, which comprised 84.94 and 68.8 percent, respectively, of the poundage take of these nets.
- L'Evolution de la Peche a Saint-Jean-de-Luz (Development of the Fisheries of Saint-Jean-de-Luz), by F. Doumenge, 12 pp., illus., printed in French. Centre Regional de la Productivite et des Etudes Economiques, Montpellier, France, 1955.
- Fish for More Fishermen, 51 pp., illus., printed.

 Michigan Department of Conservation, Lansing
 26, Mich. Principally for sport fishermen.
- "The Fish Population of a Spring-Fed Swamp in the Mississippi Bottoms of Southern Illinois," by Gerald E. Gunning and William M. Lewis, article, <u>Ecology</u>, vol. 36, no. 4, October 1955, pp. 552-558, illus., printed. Duke University Press, Box 6697, College Station, Durham, N.C.
- (Florida) Semi-Annual Report, 15 November 1954 to 15 May 1955 (A Technical Report to The Office of Naval Research), by Ilmo Hela, Lansing P. Wagner, and Frank Chew, Report 55-27, 75 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., September 1955. This progress report covers the oceanographic work performed under contract Nonr 840(01), known as Tropical Oceanography, from November 15, 1954 to May 15, 1955.
- Follow the Whale, by Ivan T. Sanderson, 423 pp., illus., printed, \$6. Little, Brown & Co., 34 Beacon St., Boston, Mass.
- "Frozen Oysters," by Margaret L. Morton and W. J. Dyer, article, Journal of the Fisheries Research Board of Canada, vol. 13, no. 1, January 1956, pp. 47-51, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Quick-frozen freshly-shucked oysters stored at -10° F. (-23° C.) did not

deteriorate significantly during a storage period of 9 months, as assessed by taste panels on the simmered oysters. Slow freezing and storage at higher temperatures resulted in a much greater loss in quality, and objectionable darkening occurred. Preparation as a stew largely masked this deterioration.

(Great Lakes) "The United States-Canadian Great Lakes Fisheries Convention," by Charles B. Selak, Jr., article, American Journal of International Law, vol. 50, no. 1, January 1956, pp. 122-129, printed. The American Society of International Law, Prince and Lemon Sts., Lancaster, Pa. Describes the organization and purpose of the United States-Canadian Great Lakes Fisheries Convention which was signed on September 10, 1954, and entered into force on the exchange of instruments of ratification on October 11, 1955. The purpose of this treaty is to secure through joint action the improvement of Great Lakes fisheries which are of common concern to the contracting parties. and eventually to bring these fisheries to a condition of maximum sustained productivity. Present fishery research on the Great Lakes is conducted by eleven separate agencies. The convention provides for the coordination of these efforts by one activity, the Great Lakes Fishery Commission, so that greater accomplishments can be made to eradicate the sea lamprey--the most serious known cause of the depletion of Great Lakes fisheries.

Grimsby--The World's Premier Fishing Port, 107 pp., Illus., printed. Grimsby Trawler Owners' Association, Fish Dock Rd., Grimsby, England. A brief history of the fishing port of Grimsby and the years of development. Also includes chapters on the fishermen of Grimsby, Grimsby Trawler Owners' Association, the fishing industry and how it works, Grimsby processing techniques, sales by auction, ship repairing and engineering, ancillary trades, coal and oil bunkering, British cod-liver oil, the work of the White Fish Authority, scientific research, white-fish meal, training schemes, fish facts, and a plan of the docks at Grimsby.

Gulf States Marine Fisheries Commission Sixth
Annual Report 1954-55 (to the Congress of the
United States and to the Governors and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 23 pp., printed. Gulf
States Marine Fisheries Commission, 312
Audubon Bldg., New Orleans 16, La. Contains
the Commission's activities for the period October 1954-October 1955, with a summary of
the principal decisions reached at the two regular sessions. Summarizes the principal activities and plans of the marine fishery administrations of the Gulf States in the interest of
bringing about the proper utilization of the fishery resources: Included are short discussions
of the U. S. Fish and Wildlife Service activities
in technological and biological research and exploratory fishing in the Gulf area. A financial
report of the Commission is included.

(International Council for Exploration of the Sea)

Report of the Forty-third Meeting of the Council,

21 pp., printed. Conseil Permanent International Pour L'Exploration de la Mer, Charlottenlund Slot, Denmark, January 1956. An official report of the 43rd meeting of the International Council for the Exploration of the Sea, which was held in Copenhagen in October-November 1955.

(Iran) Basic Data on the Economy of Iran, Part I, Economic Report No. 55-108, 7 pp., printed, 10¢. Bureau of Foreign Commerce, World Trade Information Service, Washington, D. C. (For sale at the U. S. Government Printing Office, Washington 25, D. C., or the U. S. Department of Commerce Field Offices).

Lake Victoria Fisheries Service Annual Report, 1954/55 (covering the period January 1954 to July 1955), by J. D. Kelsall, 53 pp., illus., printed. East Africa High Commission, Nairobi, Kenya, 1955.

The Life in the Sea, by Ralph Buchsbaum, 101 pp., printed, \$1.50. University of Oregon Press, Eugene, Oregon, 1955.

"The Limits of Swedish Territorial Waters," by Torsten Gihl, article, <u>American Journal of International Law</u>, vol. 50, no. 1, <u>January 1956</u>, pp. 120-122, printed. The American Society of International Law, Prince and Lemon Sts., Lancaster, Pa. The author comments on an article entitled "Historical Origins of the Three-Mile Limit," which appeared in vol. 48 of the American Journal of International Law (1954). He states, that "the history of the limits of Swedish territorial waters may be summarized as follows: (a) Originally the limit was defined by the range of vision; (b) In 1758 this limit was replaced by one of 12 or 18 nautical miles, which was considered equivalent to the range of vision; (c) For this limit was substituted in 1779 a four-mile limit, which has been retained ever since and is still in force. In Anglo-Saxon literature a breadth of territorial waters exceeding three nautical miles is sometimes regarded as an (possibly illegitimate) 'extension' of territorial waters beyond the three-mile limit that is characterized as normal. It may therefore be pointed out that the Swedish four-mile limit was in actual fact a reduction of the breadth of territorial waters that had formerly been in force. The Swedish four-mile limit is presumably of earlier date than any three-mile limit that has been officially fixed in any state."

"The Lipids of Fish: 6. The Lipids of Cod Flesh," by M. Dolores Garcia, J. A. Lovern, and June Olley, article, The Biochemical Journal, vol. 62, no. 1, January 1956, pp. 99-107, printed, 20s. (US\$3.25) net per issue. Cambridge University Press, London, N.W. 1, England.

"The Lipids of Fish: 7. Phosphate Esters in the Lipids of Haddock and Cod Flesh," by June Olley, article, The Biochemical Journal, vol. 62, no. 1, January 1956, pp. 107-114, printed 20s. (US\$3.25) net per issue. Cambridge Uniniversity Press, London, N.W. 1, England.

- "Multiple Use of Salmon Rivers," article, <u>Trade</u>
 <u>News</u>, vol. 8, no 7, January 1956, pp. 10-11, 13, illus., printed. Department of Fisheries, Ottawa, Canada. Discusses the effects suggested power development in British Columbia would have on the fisheries. According to the article, "Even the most general survey indicates that in the full development of the Fraser for power as it is presently suggested and in spite of the provision of the best modern fish protection facilities, it is evident that: (1) the construction of a storage dam at the outlet of Babine Lake would practically destroy a valuable segment of the Skeena River sockeye fishery; and (2) the construction of four power dams on the main Fraser and six on the Thompson River would preclude the preservation and extension of the salmon and steelhead runs which normally proceed to areas above these dams. This conclusion is reached on the basis of the mortality to seaward migrant young salmon at a series of dams and of the delays in migration caused to the adults. In addition, the proposed development would create may other problems in relation to spawning grounds, stream and lake temperatures and general ecology, and fry migrations, which could seriously interfere with the maintenance of the fishery.
- "Mortality of Oysters and Abundance of Certain Associates as Related to Salinity," by Gono Gunter, article, Ecology, vol. 36, no. 4, October 1955, pp. 601-605, printed. Duke University Press, Box 6697, College Station, Durham, N. C.
- "On the Methods Used by the Starfish (<u>Pisaster ochraceus</u>) in Opening Three Types of <u>Bivalve Molluses</u>," by Howard M. Feder, article, <u>Ecology</u>, vol. 36, no. 4, October 1955, pp. 764-767, printed. Duke University Press, Box 6697, College Station, Durham, N. C.
- The Philippine Journal of Fisheries, vol. 3, no. 1, January-June 1955, 96 pp., illus., printed. Office of Agricultural Information, Department of Agriculture and Natural Resources, Manila, Philippines, 1955. Contains the following articles: "The Basnig, a Bag Net for Pelagic Fishing in the Philippines," by Santos B. Rasalan and D. V. Villadolid; "A Preliminary Study on the Preservative Action of Furasukin and Mild Heat in Canning Bangos (Chanos chanos)," by Olympia B. Navarro and Jose I. Sulit; "Studies on the Preparation of Salted Fish Paste (Bagong) from Dried Dilis (Stolephorus indicus)," by Claro Martin and Jose I. Sulit; "Studies on the Extraction of Alginic Acid from Some Species of Philippine Sargassum," by Jose I. Sulit and Regina C. San Juan; "A Report on the O:N:P: Ratios of Philippine and Adjacent Waters," by Teodoro G. Megia and Ricardo G. Lao; and "The Abuyan, an Improved Type of Goby Fishing Gear, used in Laguna de Bay, with Notes on the Composition of the Commercial Catches," by Santiago R. Capco and Porfirio R. Manacop.
- Progress Report on the Economic Survey of Salmon Fishermen in British Columbia, 1953 and

- 1954, 6 pp., processed. Department of Fisheries, Ottawa, Canada, December 1955. Presents the major findings of surveys conducted by the Department of Fisheries on the economic activities of salmon fishermen in British Columbia for 1953 and 1954.
- A Report of the Field Investigation on Poisonous and Venomous Fishes of Cocos and Galapagos Islands, by F. Douglas Horton and Chester C. Lindt, 13 pp., processed. School of Tropical and Preventive Medicine, College of Medical Evangelists, Loma Linda, Calif.
- "A Resting Stage Without Encystment in the Annual Cycle of the Freshwater Copepod Cyclops strenuus strenuus," by Kaare Elgmork, article, Ecology, vol. 36, no. 4, October 1955, pp. 739-743, illus., printed. Duke University Press, Box 6697, College Station, Durham, N. C.
- The Silver Mullet Fishery in South Florida, by H. P. Mefford, Report 55-34, 15 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., December 1955. The Florida regulations on mullet fishing refer generally to the black mullet, Mugil cephalus, and no separate consideration is given in them to the silver mullet. Considering the differences in the biology of the silver mullet and the black mullet separate regulations were considered as possibly necessary. An investigation was undertaken in order to consider the necessity of regulations for the silver mullet fishery, either those now applying to black mullet or separate regulations. Additional objectives were to describe the fishery, to define the spawning period, the size at maturity, the composition of the catch, and to outline the economic aspects of the fishery. According to the author, "Landings of silver mullet have steadily decreased since 1951. Production seems to be controlled mainly by market demand. Over 95 percent of the silver mullet production comes from south Florida. As in the black mullet fishery, gill nets and seines are the principal gears used to catch silver mullet. Three species of silver mullet, Mugil curema Cuvier and Valenciennes, Mugil trichodon Poey, and Mugil gaimardianus Desmarest are caught in Florida. The peak spawning period for Mugil curema is April through June. At a size of 225 mm. (87 inches), 75 percent of the fish examined were mature. Of 1,786 fish examined, 51,4 percent were females and 48.6 percent males. At present there appears to be no necessity for the regulation of the silver mullet fishery either by the use of closed seasons or by minimum size mesh regulations. Regulations restricting the fishing for black mullet (Mugil cephalus) should specifically exclude silver mullet from these restrictions.
- Sixth Annual Report of the Commonwealth Scientific and Industrial Research Organization for the Year Ending 30th June 1954, 179 pp., printed. Government Printing Office, Canberra, Australia, 1954.
- "Spawning of the Sardine at a Definite Time of Day," by T. Gamulin and J. Hure, article, Nature,

vol. 177, no. 4500, January 28, 1956, pp. 193-194, illus., printed. MacMillan & Co., Ltd., St. Martin's St., London, W.C. 2, England.

- "Spoilage of Fish in the Vessels at Sea: 2. Treatment on the Deck and in the Hold, " by C. H. Castell, W. A. MacCallum, and H. E. Power, article, <u>Journal of the Fisheries Research</u>
 <u>Board of Canada</u>, vol. 13, no. 1, January 1956,
 pp. 21-39, illus, printed. Queen's Printer
 and Controller of Stationery, Ottawa, Canada. A study was made of some of the factors affecting the spoilage rate of fish in the trawlers at sea. It was found that two conditions were major causes of accelerated spoilage: (1) Treatments that resulted in very heavy initial contamination such as storing the fish directly against the slimy wooden pen boards; and (2) Treatments that resulted in a rise in the temperature of the fish. This latter may be a larger increase in temperature for a short period, such as exposure of the fish on the deck during warm summer weather, or a smaller increase over a longer period, such as results from inadequate or inefficient icing. Other types of carelessness and unsanitary conditions did not have any significant effect on the fish until at least 6 or 7 days, as long as they were well iced during the subsequent storage period in the hold.
- "Storage of Frozen Plaice Fillets," by W. J. Dyer and Margaret L. Morton, article, Journal of the Fisheries Research Board of Canada, vol. 13, no. 1, January 1956, pp. 129-134, illus, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Taste panel assessments of taste, texture, and grade, and estimations of soluble actomyosin and of fat spoilage on plaice fillets after frozen storage at +10° F. (-12° C.) are reported. The plaice became unpalatable at 6 to 7 months as compared with 2 to 3 months for cod and about 8 months for Atlantic halibut at +10° F. Ascorbic acid was not effective in preventing lipid deterioration. A relationship between protein denaturation and the lipid content of the fish and its deterioration is suggested.
- A Summer Study of the Biology and Ecology of East Bay, Texas. Part I. Introduction, Description of Area, Methods, Some Aspects of the Fish Community, the Invertebrate Fauna, by George K. Reid, Jr., 29 pp., illus., printed. (Reprinted from The Texas Journal of Science, vol. VII, no. 3, September, 1955, pp. 316-343.) Texas Game & Fish Commission, Austin 14, Tex.
- A Summer Study of the Biology and Ecology of
 East Bay, Texas. Part II. The Fish Fauna of
 East Bay, The Gulf Beach, and Summary, by
 George K. Reid, Jr., 25 pp., printed. (Reprinted from The Texas Journal of Science, vol.
 VII, no. 4, December 1955, pp. 430-453.) Texas
 Game & Fish Commission, Austin 14, Tex.

- Symposium on Marine and Fresh-Water Plankton in the Indo-Pacific (Held at Bangkok, Thailand, 25-26 January 1954), Ill pp., printed, \$1. Indo-Pacific Fisheries Council, Bangkok, Thailand, 1954.
- Technical Report of Fishing Boat, No. 6, 149 pp., illus., printed in Japanese with brief English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan, March 1955. Contains the following reports, with very brief abstracts in English, on various studies in progress at the Fishing Boat Laboratory: (1) "Experimental Results of Model Test and Actual Ship's Trial of the 'Seiwa-maru';" (2) "Strength Test of Laminated Beam Knees;" (3)"Wears of Cylinder, etc., of Fishing Boat Engine-V;" (4) "Automatic Net-Height Meter and Automatic Ground Rope Indicator for Trawler and Results of Experiments for these Apparatuses;" (5) "Propagation Characteristics of High Frequency Ultrasonics in Sea Water;" (6) "Reliability of Record for the Shape of Sea Bottom Obtained by Ultrasonic Echo-Sounder;" and (7) "Ultrasonic Reflection Loss of Fish Shoal and Characteristics of the Reflected Wave." An appendix lists the reports published in the past, Nos. 1-5.
- (United Kingdom) <u>Herring Industry Board</u>, 20th Annual Report for the Year Ended 31st December 1954, Cmd. 9492, 40 pp., printed. Her Majesty's Stationery Office, London, England, 1955.
- The Use of a Portable Depth Recorder for Locating Fish, by George F. Arata, Jr., Technical Series No. 15, 19 pp., illus., printed. The Marine Laboratory, University of Miami, Coral Gables, Fla., November 1955. A detailed description of the revised Bendix Model DR-10E-1 depth recorder is presented. A description of an outboard "fish" for towing the transducer is given. The results of this method of transducer mounting proved very satisfactory. Mechanical problems involving commutator interference are discussed. The recommended changes provided a model without serious operational disorders. Figures of traces positively identified as coming from the following species of fish are shown: Spanish mackerel (Scomberomorus maculatus), kingfish (Scomberomorus cavalla), bluefish (Pomatomus saltatrix), and barracuda (Sphyraena barracuda). Circumstantial evidence points to the following species also being responsible for traces: red grouper (Epenephelus morio), black grouper (Mycteroperca bonaci), and mutton snapper (Lutainus analis). The advantages of using this gear in sportfishing are explained. The author states that "It is also likely that the depth recorder could be very useful in the commercial fishery, where it could probably save time and money and allow more efficient utilization of fishing effort."

PADE LIST

The Office of Intelligence and Services, Bureau of Foreign Commerce, U.S. Department of Commerce, Washington 25, D.C., has published the following mimeographed trade list. Copies of this list may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 each.

Oils (Animal, Fish and Vegetable) - Importers,
Dealers, Producers, Refiners, and ExportersIsrael, 7 pages (February 1956). Lists the
name and address, size of firm, and products
handled by each firm. Includes a brief summary on 1954 domestic production and consumption from agricultural sources only and the 1954
imports of animal, fish, and vegetable oils. The
total imports of fish-liver oils in 1954 was 250
metric tons, valued at US\$200, 304.



SQUID AND OCTOPUS AS FOOD

Squid are prized as food in some countries, especially those around the Mediterranean Sea. They are eaten only in relatively small quantities in this country. These animals are one of the most underexploited resources from the sea, for the reason that most people are too squeamish to eat such odd-looking creatures. They have an excellent flavor, tasting a little like clams, so their consumption will probably increase through the years. The Marine Laboratory of the University of Miami is doing research on squid and octopuses, and there is squid research going on in California as well. However, considering their potential value, very little work is in progress on these animals.

--<u>Sea Secrets</u>, The Marine Laboratory, University of Miami, Coral Gables, Fla.

Editorial Assistant -- Ruth V. Keefe

Illustrator -- Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Helen Joswick

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"QUICKIE" MEALS WITH FISHERY PRODUCTS

Are you in doubt about what to serve for "quickie" lunches or dinners? The home economists of the U. S. Fish and Wildlife Service think you have a wide selection of easy-to-serve fish and shellfish specialty products or "quickies" to vary your luncheon or dinner menus.

How would you like a creamy shellfish soup for lunch or as an appetizer for dinner on one of these chilly spring days? Sounds like an expensive gourmet dish,



Shrimp and salmon steaks.

doesn't it? But, it really isn't because you can obtain frozen clam chowder, cream of lobster or shrimp soup, oyster stew, and other varieties at your food markets at reasonable prices.

Combining vegetables with a protein food produces a dish that is not only fashionable but also delicious. For example, combine the ever-popular canned tuna with vegetables such as potatoes and peas and make attractive and delicious individual tuna pies.

Have you ever noticed how well fish and tomatoes go together? Very popular are the famous Creole dishes which formerly were dear only to the hearts of

southerners. Now the wide distribution of frozen shrimp creole has brought this dish north of the Mason-Dixon line and introduced it to northerners as well.

If you are a connoisseur of Chinese foods, another good vegetable and protein combination is shrimp chow mein. Combine shrimp, celery, and bean sprouts and serve over toasted noodles.

Perhaps you are an epicurean with a taste for variety, then the shore dinners which take only minutes to prepare and serve, are a welcome suggestion for your dining pleasure.

Raw and fried fishery products, such as the phenomenally-popular fish sticks, are favorites with families throughout the Nation. The fishing industry has marketed a packaged precooked fish-stick dinner (containing macaroni, cheese, and peas) which only requires heating in the oven. Speaking of fish sticks, crab, oyster, and shrimp are now available in breaded sticks, either raw or french fried.

What is more appetizing than a french fried fish fillet for dinner? Outside, it is a crusty golden brown; inside, tender and juicy with all the delicate flavors sealed in.

Fish cakes, including cod cakes, have been a synonym for inexpensive, nutritious, and tasty food for generations. An old-fashioned food, perhaps, but new-fashioned methods have done away with any laborious preparations as they are all prepared, ready to heat and serve.

Other shellfish quickies, ready-to-cook, include deviled crabs and imperial crabs, lobster and lobsterettes, oysters, scallops, and the favorite of many, shrimp in various forms.

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JOHN L. FARLEY, DIRECTOR



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor H.M. Bearse, Assistant Editor

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TECHNOLOGICAL STUDIES ON THE PROCESSING OF SEA LIONS

By Robert M. Kyte*

ABSTRACT

Sea lions are predators on the commercial fisheries of Alaska, Under certain conditions the processing of sea lions by cold-storage and reduction plants in Alaska might be attractive. The proximate composition of sea lions was determined. The quality of the products that might be produced is discussed.

BACKGROUND

As a result of widespread complaints from commercial fishermen of the depredations caused by Steller's sea lions (<u>Eumetopias jubata</u>) and on a basis of a study of the sea lion habits by Imler and Sarber (1947), and other information, the ban from hunting sea lions was removed in 1949. This removal of protection

apparently has not reduced appreciably the size of the sea lion herds that cause annoying loss of fish to commercial fishermen, particularly those fishing for halibut and sablefish. A further study of the habits and general biology of these predators is currently being carried out by the Alaska Department of Fisheries under a Saltonstall-Kennedy fund contract awarded by the U.S. Fish and Wildlife Service. To find a commercial use for a predator is one of the best methods for its control. It is with this in mind and also to aid in the harvesting of a possibly valuable resource that additional studies on the technology of handling sea lions are being carried out.

FACTS ABOUT SEA LIONS

The commercial processing of sea lions would require capturing a large number of the animals. It is very difficult to recover sea lions if they are in the water. It takes a carefully placed shot in the head to kill a sea lion and most of the animals sink quickly when killed. A wounded ani-



A 650-pound female sea lion.

malusually escapes capture by diving under water and swimming away or by dying on *Analytical Chemist, Fishery Products Laboratory, Ketchikan, Alaska.

the bottom where he cannot be recovered. A better way then to recover sea lions is to kill them when they are on the land. During June and early July the sea lions haul







Skinning a 650-pound sea lion. Cut indicates blubber thickness on brisket.

out on wave-beaten rocks and islands to have their pups and to breed. The rookeries are in exposed locations off the coast of Alaska and extend from Southeastern Alaska to far out among the Aleutian Islands and into the Bering Sea. Here the male holds

	Table 1 - Measurements and Yield Data for Sea Lions of Varying Size and Sex												
No.	Sex	Length (Nose to Tip of Tail)		Blubber Thickness (on Brisket)	Total Weight		ver		ide	(Free o	ubber)	Blub	ber
			. (Inches)		(Lbs.)	Weight	% Total Body Wt.	Weight	% Total Body Wt.		% Total Body Wt.	Weight (Lbs.)	% Total Body Wt.
1	Male	- 1	-	- 1	425	13	3,1	28	6.6	274	35.7	63	14.8
2	Female	-	-	-	343	14	4.1	21	6.1	274	35.7	54	15.8
3.	Male	87	72	13	695	19	2.7	-	-	-	-	-	-
4	Female	98	67	-	527	25 1	4.8	-	- 1	-	- 1	-	
5	Female	97	64	134	643	20	3.1	36	5.6	202	31.4	79	12.3
6	Female	89	54		484	141	3.0	24	5.0	153	31.6	52	10.8
1.7	Male	109	82	21	1,121	26	2.3	70	6.2	341	30.4	128	11.4
	nimals 1 and 2 were sexually immature, probably 2- or 3-year olds,										indication of nu		
Anima	simal 3 was in a semidecomposed state when found ashore and complete data were not obtainable, simal 4 had well developed fetus and appeared to be nursing; 26 pounds of mammary tissue and milk were recovered. Only partial data were obtained.						Animal 7 has pounds eac	i a stomach h, Stomach	which weighed weights of all a	102 pounds; s nimals are i	stomachs of othe ncluded in the to	er animals we otal weight,	ighed less than 20

a harem of 10 to 20 females. The cow bears a single pup and again breeds before she returns to the sea to feed. (Kenyon and Scheffer 1953.) At other times herds of sea lions use favorite rocks to haul out on and rest. The resting spots are exposed places either along

Table 2 - Proximate Composition of Meals Prepared									
from Sea Lions									
Type of Meal	Moisture	Oil	Protein	Ash					
(Percent)									
Liver meal	12.8	19.7	51.1	5.2					
Viscera meal	8.0	20.2	70.2	2.9					
Bone meal	5.2	27.6	44.7	22.3					
Meat meal	5.9	27.0	58.9	3.9					
Note: The analyses accour	nt for only 88.8	percent of 1	he liver meal	and 95.7 per-					

Note: The analyses account for only 88.8 percent of the liver meal and 95.7 percent of the meat meal, Glycogen and other carbohydrates perhaps account for the balance. Local fishermen and U. S. Fish and Wildlife Service agents and reports (Imler and Sarber 1947) were consulted in plotting on charts the size and location of sea-lion rookeries and hauling-out grounds in south-

the coast or near the mouth

of streams.

eastern Alaska. A number of rookeries located within a day's run of the herring reduction plants were indicated. Two of the largest rookeries, Forrester Island

and Hazy Islands, are bird refuges on which hunting is prohibited. However, several of the fishermen thought it possible for a crew of four on a salmon seine boat to re-

cover 500 sea lions during the sixweek breeding season of June to mid-July. Much larger rookeries, with shorter hauls to reduction plants and cold-storage facilities, are available in the Kodiak-Cook Inlet area.

Table 3 - Proximate Composition of Sea Lions and Herring									
Specimen	Moisture	Oil	Protein	Ash					
		(Per	cent)						
Sea lion	58.2	58.2 22.1 16.4		3.1					
Herring	66	16	16	2					

ANALYSES OF SEVEN ANIMALS

Seven animals were recovered near Ketchikan, Alaska, in December 1955 and January 1956 and processed to get information and data which would be of value to





Removing hide and blubber from a 650-pound sea lion at Ketchikan, Alaska.

A 650-pound sea lion with hide and blubber almost removed,

cold-storage and reduction-plant operators in estimating the economics of a sealion operation. The yield of meat, blubber, liver, and hide obtained from animals

Table 4 - Proximate Composition of Sea Lion Mammary Tissue from a Nursing Cow and of Sea Lion Blubber

Tissue from a Nursing	Cow and of Sea Lion	Blubber
Analyses	Mammary Tissue	Blubber
	(Percent)	
Moisture	40.7	16.0
Oil		78.8
Protein	11.6	5.0
Ash	0.9	0.2

of varying size and sex are reported in table 1.

The data indicate significant differences between individuals, but roughly 33 percent of the carcass weight is meat, 12 percent blubber, and 6 percent

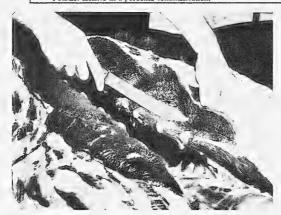
hide. The liver, a fairly rich source of vitamins, is large--almost 3 percent of the carcass weight. The meat reported is that which could easily be recovered in butchering. Most of the "fat-free" meat comes from the neck, foreflippers, and brisket where the meat is 4 to 6 inches thick. This meat was cut free of bone and blubber,

packaged in polyethylene bags and frozen for mink-feeding studies at the Experimental Fur Station, Petersburg, Alaska. Analysis of the meat indicated a much

Table 5 - Some Physical and Chemical Constants for Sea Lion Blubber Oil ar	L .
if able 5 - Some Physical and Chemical Constants for Sea Lion Blubber Off ar	aa i
Viscera Oil and Fur-Seal Blubber Oil	

Viscera Oil and Fur-Seal Blubber Oil									
Analyses	Sea I	ion	Fur-Seal						
Analyses	Blubber Oil	Viscera Oil	Blubber Oil						
Specific gravity 25 C		0.9175	1/ 0.9254 (60°F)						
Iodine value	136.9	139.4	(2/137.3)						
Saponification equivalent	181.1	187.3	1/181.2						
Unsaponifiable matter	$\frac{1}{2}$ 1.4	-	$\frac{1}{2}$ / 0.4						

 Bailey, Carter, and Swain (1952).
 Data for 1954 fur-seal oil produced on Pribilof Islands. The data were obtained from the general manager of the Pribilof Islands in a personal communication.



higher fat content (8-13 percent) than the 2.5 percent reported by Dassow (1955). This higher fat content was probably the result of two factors: First, to remove all the blubber when skinning demands more care and time than would be practical for a commercial operation; second, portions of the meat had a higher fat content than the particular dark lean tissues sampled by Dassow. Fur farmers seek a feed with low fat content because unsaturated acids in fats quickly become rancid. The deposit of rancid fat in

Butchering a 650-pound female sea lion, Meat thickness on brisket is 4-6 inches.

the tissue of mink and other animals is associated with 'yellow fat" disease. The fat is not so objectionable in fish-hatchery feeding. Methods of producing meat of lower fat content will be investigated. This might be accomplished either through different butchering techniques or by selecting for these market outlets those sections of the carcass in which the oil content of the meat is low.



Meat on brisket of 650-pound sea lion is 4-6 inches thick,

MEALS

To determine the proximate composition and protein quality of meals that might be produced from sea lions, the entire carcasses (except the hide and blubber) of

animals 1 and 2 were separated into fractions and dried to meals. The meals were prepared by grinding the fraction into pieces \$\frac{1}{4}\$ inch or less and then drying in circulating air at a controlled temperature of 150° F. The viscera was cooked, to aid in handling, for 20 minutes at 240° F. before grinding. The proximate analyses of these meals are shown in table 2.

The viscera meal included all of the viscera except the liver, which was treated separately, and the stomach and sex organ which were saved for biological study. The bone meal includes all of the bones from which the meat had been removed, together with the head and flippers with their attached hide and blubber. The meat meal was representative of the bone- and blubber-free meat.

The results of chick-feeding tests at the University of California indicated the liver-meal protein to be of good quality (comparable to the best fish meals) and the viscera-meal protein to



Removing lean meat (to be used for mink feeding tests) from sea lion carcass at the Fishery Products Laboratory, Ketchikan, Alaska.

be of fair quality. The other meals have not yet been evaluated by chick-feeding tests.

PROXIMATE COMPOSITION OF CARCASS

From the proximate analyses of the liver meal, viscera meal, and bone meal and representative samples of the meat and blubber, the following proximate composition of the whole carcass (less hide) of sea lions 1 and 2 was calculated. This proximate composition, together with a proximate composition of herring for comparison, is shown in table 3.

The oil content of these sea lions is high. The seasonal variations in the composition of sea lions is not yet known. Fishermen report bull seals to have a particularly thick layer of blubber when first seen on the rookeries in late May. Perhaps this store of blubber sees them through the fasting of the breeding season. If this is so the fat content of the animal would vary considerably with the season of capture.

Sea lion 4 (table 1) was carrying a well-developed fetus (6 pounds) and, in addition, had well-developed milk-secreting mammary tissue extending through the blubber from the foreflippers to the tail flipper. This mammary tissue weighed

26 pounds or approximately 40 percent of the total blubber weight. This animal might be similar in composition to the females recovered from rookeries during the mating season. The proximate composition of the mammary tissue is compared with that of the blubber in table 4.

The calculated composition of a nursing cow is then 59.8 percent moisture, 20.0 percent oil, 17.2 percent protein, and 3.1 percent ash. As was expected, the



Placing sea lion meat wrapped in polyethylene bags in freezer. Frozen meat was shipped to Petersburg, Alaska, for mink-feeding experiments.

and 3.1 percent ash. As was expected, the cow showed a lower oil content and higher protein content than the immature animals whose composition is given in table 3.

OII.

Samples of oil were rendered from the blubber and from the viscera of the sea lions. Some of the chemical and physical constants of these oils are given in table 5. Fur-seal oil is included in the table for comparison. It is apparent that the chemical composition of these oils is very similar.

Table 6 shows the price paid early in September for seal, herring, and menhaden oil for the last five years.

Fur-seal oil follows the general trend of fish-oil market prices. However, since it finds a special market in the leather industry, in two of the last five years it brought a premium price above fish oils. Similar trends might hold true for predicting the market value of sea-lion oil.

HIDES

The hides of sea lions produce on tanning a heavy-bodied leather which can be split to make a soft durable leather. How-

ever, the leather appears at this time to be of no commercial value because the hides have too many defects, e.g. cuts and scars (Dassow 1955). Investigation of new uses for sea lion hides is being carried out at this laboratory.

UTILIZATION OF SEA LIONS

Interest in utilizing sea lions has been keen, but no one has yet undertaken a commercial operation. The butchering and reduction of sea lions and hair seals might be attractive to a herring reduction plant operator during periods when the herring fishery was closed. This would be true particularly during the time when the quota for the first half of a season had been met and before the second half of the season opened. In addition, an operator with cold storage facilities as well as reduction plant equipment might find butchering sea lions a profitable way to utilize idle plant capacity. The meat so preserved might be sold for fur animal or fish food at a better price later in the season.

SUMMARY

Sea lions are predators on the commercial fisheries of Alaska causing continuing financial loss and annoyance to the fisherman. A good way to control a predator is to find a commercial use for it. Investigation indicated a number of small sea-lion

rookeries in southeastern Alaska within one day's run of existing cold-storage and reduction plant facilities. Under certain conditions the handling of sea lions by these plants might be attractive.

Table 6 - Price the First Week in September for Fur-Seal, Herring, and Menhaden Oil, 1951-55							
Year		Average	Average Market Price in Cents/Pound				
Teal		Fur-SealOil1/	Herring Oil 2/	Menhaden Oil 2/			
September	1955	9.50	8.25	7.75 - 8.25			
- 11	1954	7.80	8.00- 8.50	7.75 - 8.00			
11	1953	7.60	7.25 - 7.75	6.125- 7.00			
**	1952	6.90	6.75	6.50			
11	1951	13,10	10.00-11.00	10.00 -10.50			

I/ Selling price in Seattle of tur-seal oil produced on Pribflot Islands. This oil is usually marketed early in September. The prices were obtained from the general manager of the Pribilof Islands in a personal communication.

2/ Data obtained from the daily "Fishery Products Market Report," Market News Service, U. S. Fish and Wildlife Service, Seattle, Wash,

Seven sea lions were caught near Ketchikan, Alaska, in December 1955, and January 1956. From these animals the yields of meat, liver, blubber, and hide were determined and the proximate composition of an immature animal and a nursing cow were calculated. The oil rendered from sea-lions was found to be similar in chemical composition to fur-seal oil, an oil which usually follows the market price of fish oils, but in some years brings a premium over fish oils.

The meat from sea lions comprises about one-third of the carcass weight and might find a market in fur-animal or fish-hatchery feeding, competing with whale and horse meat. No commercial use has yet been found for the hide.

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CHITIN THREADS FROM LOBSTER SHELLS

It is stated that a method for preparing crude chitin in good yields from lobster shells has been developed by combining the most attractive features of the conventional methods. The limited experiments carried out at the Fisheries Experimental Station, Halifax, N. S., Canada, are reported to have indicated that chitin threads can be produced easily from lobster shells.

-- Trade News, January 1954

IRON SULFIDE DISCOLORATION OF TUNA CANS 1/2

No. 3 - Effect of Variables Introduced by the Fish

By George M. Pigott* and M. E. Stansby**

INTRODUCTION

During recent years, certain batches of solid-pack canned tuna have developed an iron sulfide formation on the can area adjacent to the headspace. This paper is the third in a series of six papers in which an investigation of the problem of can discoloration is being reported (Pigott and Stansby 1955).

The degree of spoilage, the length of time that the fish are held in cold storage, and the species of tuna canned are the three primary variables introduced into the canning process attributable to the fish itself. The objective of this paper is to report the results of an investigation of these three variables.

SOURCE OF COMMERCIAL TUNA

Tuna being canned by American packers is from two major sources: the Pacific Ocean off the west coast of the United States and off the northern portion of South America, and the western

Experimental fish in retorts for precooking.

Tuna caught off the coasts of the United States and South America are taken by pole and line, by trolling, and by purseseining. Most of the larger vessels are equipped with freezing brine-tank facilities so that the fish may be frozen shortly after being caught. The freezerships remain on the fishing grounds until the catch is considered a"payload" (a few weeks to several months) before delivering the fish to the canneries. Vessels using ice to preserve the catch are generally out of port about two weeks. These iced fish, referred to as "local fish," are usually packed as soon as they are received at the cannery.

and central Pacific Ocean.

The Japanese fishing fleet accounts for most of the tuna caught in the western and central Pacific Ocean. The Japanese tuna fishery is quite different from that of the United States, owing primarily to the distances the boats must travel and to the depth at which the fish are found. The fish are usually caught by pole and line and by long-lining (Shapiro 1948). Large motherships, equipped with freezing and storage facilities, accompany the fishing fleets to sea and receive the fish from catcher boats. The frozen tuna is taken to Japan where the fish destined to be sold to United States buyers is sorted by size and species and is held in cold storage for shipment.

* Formerly Chemical Engineer, Continental Can Company, Seattle, Wash.

** Chief, Pacific Coast and Alaska Technological Research, Fishery Technological Laboratory, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Seattle, Wash.

1/ This investigation, which was carried out at the Seattle Technological Laboratory, U. S. Fish and Wildlife Service, was jointly sponsored by the Continental Can Company and the U. S. Fish and Wildlife Service.

COMMERCIAL CANNING OF TUNA

Tuna packing is unique among fish-packing operations in that tuna is given a preliminary steam cook (called the precook) before it is canned. The purpose of the precook is to remove the tuna oil and make the fish easier to clean. Frozen tuna is thawed and butchered before being precooked. The butchering consists of removal of viscera and gills.

Successful precooking of tuna depends largely on the ability of the operator to judge the condition of the raw fish. Such variables as oil content and initial temperature of fish have a bearing on the optimum precook. The time of precook varies from 1 to 2 hours for a very small fish to 8 to 10 hours for a very large fish. The temperature of the cooker normally varies from 212 to 220 F. It is important not to bring the cooker temperature up too rapidly or the skin breaks and the meat tissues are injured.

After being precooked, the tuna are cooled--usually overnight--and then cleaned in preparation for packing into the can. This cleaning step consists of removing the head, scraping off the skin, and splitting the fish into four longitudinal loins at which point the backbone is removed. Dark meat and blood are scraped from the section of the loin adjacent to the backbone and to the lateral line. For production of the solid pack, the cleaned loins are then cut into sections that will fit into the cans.

Tuna is normally packed in $\frac{1}{2}$ -pound tuna cans designated as 307 x 113 ($3\frac{7}{16}$ inches diameter and $1\frac{13}{16}$ inches high). Approximately $5\frac{1}{2}$ to 6 ounces of meat, $1\frac{1}{2}$ ounces soya or cottonseed oil, and $\frac{1}{8}$ ounce salt are placed into each can. The cans are then closed under vacuum by a can seamer. Most packers retort the closed cans at 240° F. for 75 minutes, after which time the cans are cooled and labeled for marketing.

This outline of tuna packing is very general, since all canners have their own modifications and special techniques in plant operation.

SAMPLES USED IN EXPERIMENTAL WORK

LOCAL ALBACORE: During August 1953, a collection trip was made aboard a tuna vessel off lower California. A total of 74 troll-caught albacore from the commercial catch were tagged for use in sulfide discoloration studies. Three groups of fish averaging 12 to 15 pounds in weight were obtained. The groups were designated as (1) fresh, (2) slightly spoiled, and (3) spoiled.

The fresh fish were caught in the cool of evening and iced shortly after being caught. This group was stored in ice on board the vessel for two days before reaching port. All fish in Table 1 - Effect of Precook on Sulfide Content

ing port. All fish in the group were judged to be in excellent condition when unloaded.

The fish designated as slightly spoiled were caught in the morning and left on

- 01 .	Local Albacore									
	of "Local" Albacore									
Hydrogen S	ulfide Content of "L	local" Albacore								
	After	After								
Raw 12 Normal Precook		Normal Precool								
Micrograms	Micrograms	Micrograms								
er 100 Gms.	Per 100 Gms.	Per 100 Gms.								
16	0	0								
26	Trace	0								
	Raw Iicrograms er 100 Gms.	$ \begin{array}{c cccc} Raw & \frac{1}{2} \ Normal \ Precook \\ \hline Alicrograms & Micrograms \\ \hline Cer 100 \ Gms. & Per 100 \ Gms. \\ \hline 16 & 0 \\ \hline \end{array} $								

deck approximately 11 hours before being iced. During seven hours of this time the catch was exposed to sunlight (62 to 75 $^{\circ}$ F.). The storage time in ice was four days before reaching port. These fish were judged to be slightly spoiled when unloaded because of a slight off-odor and softness of the meat.

The third group of albacore were caught early one morning and kept on deck until the following morning (approximately 26 hours on deck; 60° to 70° F.). Storage time in ice for this group was 8 days before reaching port. Advanced spoilage was very apparent in this group at the time of unloading. The meat was extremely soft and a very strong odor was detected. The belly cavity of each of these fish gave a strong odor of hydrogen sulfide at the time of butchering.

It should be emphasized that the first two of the above groups of fish were part of the commercial catch for the particular day. That is, these two experimental lots were parts of larger batches which were canned commercially after the fish were landed in San Diego. Every effort was made to duplicate commercial conditions during all phases of catching, handling, and canning of the experimental fish.

The iced fish were quick-frozen immediately after being unloaded in San Diego, Calif., shipped to Seattle, Wash., via refrigerated truck, and stored at -20° F. until needed for experimental work.

The advantage of securing a large batch of tuna of known history, such as this, was that frozen control-samples could be held for all experimental packs. Thus, if an experiment gave significant results, there were always other samples from the same lot with which to extend the studies.

IMPORTED ALBACORE: Imported albacore tuna from Japan were obtained from several canneries. These samples were not as desirable for these experiments as the local albacore, since no information was available as to the catching methods, length of time in cold storage, and other factors.

YELLOWFIN: A large batch of yellowfin tuna was supplied by the Pacific Oceanic Fishery Investigations, U. S. Fish and Wildlife Service. The fish, which ranged from 50 to 150 pounds, were taken by long lines in the South Pacific, frozen, and shipped to Seattle by refrigerated steamer. Tuna from this area that weigh over 120 pounds are often rejected by Hawaiian canners because the meat of the fish develops an off-color after the precook. The off-colored meat ranges from a slightly darker-than-normal to a dark gray-green or brownish-mahogany color.

<u>CANNED COMMERCIAL PACKS:</u> Cans from packs of commercially-canned albacore and yellowfin tuna were obtained from various packers on the West Coast. Samples from "complaint" packs with can discoloration were secured whenever possible.

EFFECT OF SPOILAGE

After fish have been caught, the proteinaceous materials in them deteriorate rapidly, owing to the action of bacteria and enzymes. Therefore, if fresh fish are not frozen or canned soon after being taken from the water, changes take placethat are detrimental to the quality of the fish. A series of experiments were carried out to determine the effect of spoilage.

SPOILAGE PRIOR TO PRECOOKING: Sulfide content was determined immediately prior to precooking on two samples from two groups of "local" albacore tuna. One group had been frozen when fresh; the other had been frozen when somewhat spoiled. The fish in each group were then divided into two subgroups, one subgroup being precooked the normal time and the other being precooked one-half the normal time. All samples were again analyzed for hydrogen sulfide after the meat had cooled and was ready for canning. The results, given in table 1, show that precooking drives the free sulfide from the meat so that the fish, as it is ready for canning, contains no loosely-bound sulfide. Throughout this investigation, no free sulfide was found in the many samples of both albacore and yellowfin that were analyzed for sulfide after the fish were precooked and ready for canning.

Raw albacore and yellowfin at different stages of deterioration were precooked and then packed in single-enamel cans of the same type that were used by industry½/ when the initial outbreaks of sulfide discoloration occurred. In no instance did spoilage of the raw fish cause worse can discoloration than that found with the fresh fish.

SPOILAGE AFTER PRECOOKING: A pack similar to that described above was canned in order to determine whether spoilage occurring in precooked fish had any effect on can discoloration. Albacore and yellowfin were precooked and allowed to stand, at room temperature, for periods up to 4 days and, at 32 F., for periods up to 2 weeks before being canned. These fish showed no signs of spoilage at this stage except for the development of some rancidity in the dark meat. As in the case when the raw fish were spoiled, fish spoiled after precook had no effect on can discoloration.

EFFECT OF TIME IN COLD STORAGE

The fish used in experiments in which the effect of spoilage was investigated had been in cold storage for a period of about one month. Another series of experiments were run in which fish were canned after various periods of cold storage in order to determine whether the oxidation or dehydration that takes place during cold storage had some effect on can discoloration.

The samples of local albacore that were used in this investigation showed no signs of causing can discoloration when canned at intervals up to 14 months. After this group of fish had been in cold storage for 14 months, however, can discoloration was noted when the fish were canned as solid packs.

It was also noted that the groups of albacore that had been spoiled before being frozen and then held for 14 months in the frozen stage caused worse can discoloration than did the group of albacore that was frozen when fresh and then stored.

The yellowfin used in these experiments caused can discoloration to a slight extent when a solid pack was made after one month of cold storage. As these fish were kept in cold storage for longer periods of time, the solid packs prepared from this lot at intervals showed increasing can discoloration.

EFFECT OF SPECIES

In this investigation of iron sulfide discoloration of tuna cans, only raw albacore and yellowfin tuna were used for canning experimental packs. All imported albacore from Japan caused very bad discoloration when packed in single-enamel cans. Yellowfin from the central Pacific also caused discoloration but not as much as did the imported albacore. The local albacore did not cause discoloration until it had been in cold storage for 14 months, after which time the discoloration was comparable to that of the imported albacore. The imported albacore had doubtlessly been held in frozen storage for an extended period of time when they were received, but, unfortunately, the exact storage time was not known.

CONCLUSIONS

From the work reported in this paper, the following conclusions are apparent:

1. Essentially all of the free sulfides in the meat of raw tuna, regardless of the degree of freshness of meat, were driven off during the precook.

1/ Unless otherwise stated all tuna canned throughout this investigation were canned as solid packs in these single-enamel cans so that maximum discoloration would be produced where such an effect had occurred.

- Of the samples used in this work, spoilage either before or after precooking had no effect on discoloration unless the fish were subsequently stored for extended periods in which case the spoiled fish caused somewhat greater discoloration.
- 3. Increasing the length of time the fish were in cold storage increased the tendency for tuna to cause can discoloration.
- 4. With the samples of tuna used in this work, the length of time in cold storage had more effect on can discoloration than did the species.

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NEW ARTIFICIAL ICE

A new type of artificial ice is being used for chilling perishable foods prior to their distribution. The ice is made up of cold-retaining substances in a colloidal solution held in gel base and it does not evaporate or melt into liquid under the conditions in which the foods are handled. By modifying the chemical formula, the refrigerant can be frozen at -1.1°C., -12.2°C., and -22.2°C. (30°, 10°, and -8°F.), the freezing time being the same as that of water. The ice has been reported to be used 120 times during a period of 4 months by refreezing. It is said to lose its chilling qualities slowly, thereby insuring an even refrigeration of the product.

-- National Provisioner, August 15, 1953.



FISH OILS IN SPRAYS FOR CITRUS TREES

The quaternary ammonium salts of unsaturated fatty acids from menhaden oil have been prepared by chemists of the U. S. Fish and Wildlife Service's Fishery Technological Laboratory. Preliminary tests by Dr. Boris Sokoloff who is carrying out contract research (with funds provided by the Saltonstall-Kennedy Act) for the U. S. Fish and Wildlife Service at Florida Southern College, Lakeland, Fla., have indicated that this substance shows promise as a fungicide for spraying citrus trees.

Quaternary ammonium salts have been used extensively in industry to make use of their surface active and bactericidal properties. Fish oils have been shown in previous experimental work by Dr. Sokoloff to possess desirable properties for application as a spray in the citrus industry. By preparation of the quaternary ammonium salts of the unsaturated fish oil fatty acids, it is hoped to combine the beneficial effects of both in a single compound. Extensive laboratory and orchard tests still remain to be carried out before the full value and methods of application for fish oil products of this type can be established.

The quaternary ammonium salt was made by first preparing the unsaturated fatty acid alcohols from menhaden oil by sodium reduction. The unsaturated alcohols were then separated by fractional crystallization, and the alkyl iodides prepared. These were then reacted with triethyl amine to form the quaternary ammonium salt, $\frac{1}{RN}$ (CH₃) $_3$ \bar{I} where R is the mixed unsaturated menhaden oil fatty acids.

Note: See Commercial Fisheries Review, March 1956, p. 9.

ALASKA SHRIMP WASTE HAS POSSIBILITIES AS HATCHERY FOOD

Preliminary experimental work has indicated that meals prepared from the waste of Alaska's shrimp industry may be a valuable feed for trout. Feeding tests were conducted recently at the Oregon State College Seafoods Laboratory, Astoria, Ore., with sample shrimp-waste meals prepared at the Fishery Products Laboratory, Ketchikan, Alaska. The tests indicated that the shrimp meal, because of some unknown factors, promoted an outstanding growth rate when fed to rainbow trout. The color characteristics imparted to the trout were superior also.

Further work on marketing and production problems must be carried out, however, before utilization of the approximately one million pounds of waste dumped annually by the Alaska shrimp industry becomes a reality.

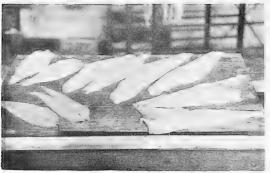


TECHNICAL NOTE NO. 33 - REDUCTION OF DEHYDRATION IN FROZEN FISH-FILLET BLOCKS

Dehydration or the loss of moisture in fishery products during storage has been a major consideration in the fishery industry since the inception of freezing and cold-storage processes. A loss in moisture of as little as 2 percent of the weight of the stored product has been found to affect adversely the flavor and texture of the product (Adams, Klein, and Simerl, 1953). Elaborate packaging procedures have been developed to minimize such losses in the finished marketed products. However, only the most primitive methods of minimizing dehydration of the product have been applied in the frozen fish-fillet block industry.

The great majority of blocks have been prepared, frozen, and stored in cold-water-waxed, kraft-fiber cartons. For shipment and subsequent storage, most blocks are then packed in corrugated cardboard master cartons. Neither of these types of packaging materials are considered to be effective barriers to the passage of water-vapor.

A consequence of such packaging has been the serious dehydration problem found in representative lots of blocks subjected to grading according to the proposed



Fillets of the type used in the manufacture of fish blocks.

standards for frozen fish-fillet blocks. In groups of five blocks of the same history, the degree of dehydration found varied from negligible to excessive amounts.

Fiber-cartoned blocks in storage have shown marked dehydration in a period of time as short as three months. The spongy, dead-white appearance of the exposed surfaces became progressively more pronounced as storage continued. After 5 months of storage, the dehydration extended from $\frac{1}{8}$ to $\frac{1}{4}$ -inch into the product. The dry and woolly, spongy

material could be scraped from the surface of the block, exposing the solidly frozen meat in the interior of the block. The flavor and texture of such blocks, when heated, was unsatisfactory, being dry, tough, and flavorless. This was also true of products prepared from such blocks.

Even a slight degree of added protection afforded a considerable lengthening of storage life without undue dehydration. A sheet of moisture-vaporproof cellophane, placed on the surface of the block of unfrozen fillets and extending over the sides of the container to be locked into place by the cover, effectively reduced moisture transfer during subsequent storage. Frozen blocks wrapped in heavy-duty aluminum foil have been held in frozen storage for periods of over a year without noticeable dehydration.

During 1955, a total of 48 million pounds of frozen fish-fillet blocks, valued at over \$9 million, were produced. If the production of frozen fish-fillet blocks is to retain its importance in the fishing industry, greater attention must be paid to the

maintenance of quality in the product. Not the least of these problems is the use of proper packaging materials to reduce dehydration during storage.

--J. A. HOLSTON, FISHERY PRODUCTS TECHNOLOGIST, FISHERY TECHNOLOGICAL LABORATORY, BRANCH OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, EAST BOSTON. MASS.

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INTERIM FEDERAL SPECIFICATIONS FOR CANNED SARDINES

The Interim Federal Specification for canned sardines (PP-S-0051c) was issued March 5, 1956, by the U.S. General Services Administration (GSA). It was developed by the U.S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces. It is authorized as a valid waiver to

Federal Specification PP-S-51b for use by all Federal agencies for the purchase of the product. It will be converted to a Federal specification after further coordination.

The new specifications are now in force for procurement but are subject to change after a sixmonth trial period.

The specifications were first established in 1933 and revised in 1938 and now have been brought up to date to cover many changes and improvements in the packing procedures. Among the changes has been the development of a 12-ounce institutional pack now eligible for Federal procurement.



Putting cans of sardines into cartons in a Maine canning plant,



GROWING ALGAE

The best method of growing and harvesting algae is said to be by circulating them rapidly through thin plastic tubes which expose the cells to light for only a fraction of a second at a time, permitting them to utilize the sunlight most efficiently. The bright green paste which is gathered by settling is said to taste something like raw lima beans. A harvest of 17.5 metric tons of dry algae per acre per year is foreseen. The one-celled algae when dried contain about 50 percent protein.

-- Food Field Reporter, August 24, 1953.



Additions to the Fleet of U. S. Fishing Vessels

MARCH 1956: A total of 17 vessels of 5 net tons and over were issued first documents as fishing craft during March 1956, according to the U. S. Bureau of Customs. This was 14 vessels less than

U. S. Vessels Issued First Documents as Fishing Craft, March 1956 with Comparisons						
Section	March JanMar. Total					
Section	1956	1955	1956	1955	1955	
	(Number)					
New England	1	1	5	6	18	
Middle Atlantic	2	2	7	3	13	
Chesapeake	4	-	12	9	54	
South Atlantic	1	3	11	9	65	
Gulf	5	11	15	19	103	
Pacific	1	11	4	17	117	
Great Lakes	2	2	2	2	9	
Alaska	1	1	3	8	35	
Hawaii	-	-	1	-	3	
Virgin Islands	-	-	-	-	1	
Total	17	31	60	73	418	
Note: Vessels have	been ass	igned t	to the v	arious	sec-	
tions on the basis of	f registe	ared he	me no	wto		

the number reported for the same month last year.

The Gulf area led all others during March 1956 with 5 newly-documented craft.

The Gulf area led all others during March 1956 with 5 newly-documented craft, followed by the Chesapeake with 4, the Middle Atlantic and Great Lakes with 2 each, and the Alaskan, New England, and South Atlantic with 1 each.

Compared with the same month of last year, in March 1956 the Gulf area had 6 less vessels and the Pacific Coast States had 10 less newly-documented craft added to their fishing fleets. The Chesapeake area had no newly-documented yessels during March 1955.

During the first quarter of 1956, a total of 60 vessels was documented as fishing craft for the first time--13 less than the number reported for the corresponding period of last year. During the first three months of 1956, the Gulf area led all others with 15 newly-documented craft, followed by the Chesapeake area with 12 and the South Atlantic area with 11.



California

AIRPLANE FLIGHTS RESUMED TO STUDY FISH DISTRIBUTION (Flight 56-2): In order to survey the distribution, abundance, and behavior of the important pelagic species found along the coast of California, that State's Department of Fish and Game airplane flights started in 1955 were resumed in 1956. The Beechcraft (4758 N) surveyed the area from Fort Bragg to San Diego, March 2-5, and the Cessna "170" (1359D) covered the area between Sacramento Reef, Lower California, and Point Conception (March 6-17) (see charts). The aerial surveys were conducted along with surface observations made by research vessels and by commercial fishing craft.

Weather conditions were ideal for aerial scouting and only one day of operation was disrupted by fog. During this period fish behavior was erratic and sudden changes in distribution and abundance of fish were observed.

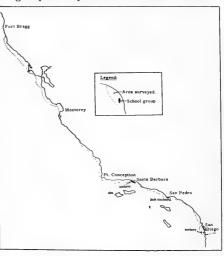
Three school groups of fish were observed along the California coast from March 2-5. These included two small school groups of anchovies, one off Santa Barbara and one off San Diego, and one school group of jack mackerel off Pt. Fermin. From March 11-17 several large school groups of anchovies were observed along the coast from San Diego to Santa Barbara where a week previously very few fish had been seen.

During the last of the flight much time was spent in studying movements and changes in abundance of these large school groups. Depths of the schools were de-

termined by the use of a portable depthrecorder mounted in the life skiff off the Department's research vessel Yellowfin. The observers in the skiff were directed by radio from the observer in the plane and as the skiff passed over a school the surface area of the school was estimated from the air. The depth of the water and the limits in depth of the top and bottom of the fish school were determined from the depth-recorder.

Sampling in daytime met with little success. Only a few fish could be caught by jigging with bare single and treble hooks and Paulas' Lures. A wire frame with treble snag hooks attached proved unsuccessful.

On March 12 biologists aboard the Scripps Institution of Oceanography research vessel <u>Paolina T</u>, were aided by the aircraft in the study of plankton concentrations in and near the areas of fish concentration.



Beechcraft Spotting Flight 56-2, March 2-5, 1956.

The following is a summary of observations on anchovy, jack mackerel, and sardine schools. Included with the aerial observations are data from other sources, such as the commercial and bait catches, M/V <u>Yellowfin</u> sampling, and commercial night-aerial scouting.

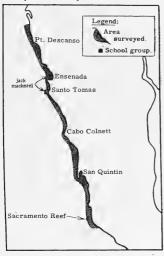
Anchovy: Two large school groups (from 80-132 schools in each school group) appeared close to the beach in the Oceanside and Huntington Beach areas sometime between the 6th and 10th of March. Smaller groups were observed in the San Diego, Santa Barbara, and Santa Monica areas. The large school groups off Huntington Beach and Oceanside remained near the beach for several days, then moved offshore in smaller units near the end of the flight period.

A movement of anchovies into Monterey Bay took place on the night of March 7 when boats scouting at night found large concentrations of fish in the bay where for several weeks previously none had been found.

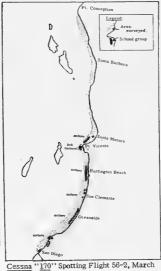
Commercial-catch sampling revealed that the adult anchovies in the Huntington Beach area were nearly all of commercial large size. The anchovies taken commercially in Monterey Bay also were of large size and from preliminary examination were predominately of the 1954-year class. Sampling by the $\underline{Yellowfin}$ revealed the presence of smaller anchovies off Pt. Vicente. These fish were probably of the 1955-year class. Sampling by the $\underline{Yellowfin}$ off Oceanside proved that the anchovies in this area were of large size.

In terms of surface area of fish observed by aerial scouting over the past two years, more anchovies were observed during this flight than on any previous flight. More schools of anchovies were observed on the June 1955 flight, but most of the schools seen then were of considerably smaller size than the schools seen during this flight. The size of the anchovies in the schools seen on this flight are much larger than the young fish seen in 1955.

<u>Sardine</u>: No schools which could be positively identified as sardine were observed during the flight. On several occasions off Huntington Beach and Santa Barbara, however, flashes seen in anchovy schools were most likely made by sardines.



<u>Cessna</u> "170" Spotting Flight 56-2, March 6-10, 1956.



Night sampling on the Yellowfin revealed the presence of young 1955-year class sardines mixed with the anchovies in both the Oceanside and Huntington Beach areas.

Large adult sardines were located by the commercial fleet off Pt. Fermin and Pt. Vicente. Several large tonnage hauls of pure sardines were reported made by jackmackerel fishermen. These fish were caught by mistake and were released.

Jack Mackerel: A small school group of jack mackerel observed near Santa To-

mas, Baja California, was being pursued by the Mexican fishing boats out of Ensenada. It was reported that small amounts of sierra (Scomberomorus) were mixed with the jack mackerel.

The school group of jack mackerel off Pt. Fermin and Pt. Vicente remained in that vicinity for several weeks. Apparently these fish were mostly "night" fish as very few schools could be seen in the daytime. Fair catches of jack mackerel mixed with Pacific mackerel and sardines were being taken sporadically during this period.

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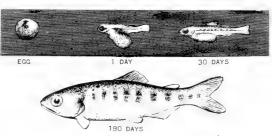
MAJOR NORTHERN CALIFORNIA KING SALMON STREAMS RESTOCKED: More than 3 million king salmon fingerlings were planted recently in three major northern California salmon streams, the California Department of Fish and Game announced April 1956.

Another salmon milestone was the release of the first fingerling king salmon from the new Nimbus Hatchery into the American River. By mid-May 1956 some 3 million fish will have been released from the hatchery. In addition, one million king salmon fingerlings from Coleman Hatchery were released about April 19 into the Mokelumne River in an effort to build up the run in that stream.

During March 2.6 million king salmon fingerlings were released into the Klamath River in Siskiyou County from the Mt. Shasta Hatchery. Eggs from which these fish were hatched were taken at the Fall Creek station.

Another 0.5 millionking salmon were released into the Russian River below the site of Coyote Dam, which is expected to create water conditions favorable to this species. At present there are only silver salmon and steel-head trout in the river.

Nimbus Hatchery's first year's production, while far below capacity because of adverse water conditions in 1955/56, will make a definite



KING SALMON (ONCORHYNCHUS TSHAWYTSCHA)

1955/56, will make a definite contribution to the Sacramento River system runs.

The Nimbus Hatchery was constructed by the U. S. Bureau of Reclamation and turned over to California's Fish and Game Department for operation to compensate for loss of natural spawning areas above Nimbus Dam. Operation costs will be borne by the Federal government as a part of the Central Valley Project.

The hatchery, located east of Sacramento, was authorized when the California Fish and Game personnel showed that 70 percent of the entire American River run spawned above Nimbus Dam, which is impassable to migrating fish.

* * * * *

YELLOWFIN AND BIG-EYED TUNA SUBSURFACE DISTRIBUTION SURVEYED (Cruise 56-S-1): The subsurface distribution and relative abundance of yellowfin and big-eyed tuna were surveyed by Calfornia's research vessel N. B. Scofield between January 10 and March 10, 1956. This cruise made in South and Central American waters was a seasonal follow up of the cruise made by the same vessel between October-November 1955 (Cruise 55-S-5). Additional objectives of the cruise were to

N. B. Scofield tuna long-line Cruise 56-S-1, Jan. 10-Mar. 10, 1956.

make limited biological and oceanographic observations and collections that may have a bearing on tuna research or other marine life.

The $M/V\,\underline{N}$. \underline{B} . $\underline{Scofield}$ departed Los Angeles Harbor, January 10, 1956, and proceeded through the first nine scheduled stations. The tenth and eleventh scheduled stations were omitted due to foul weather. Nine more stations were occupied before the vessel arrived at Balboa, Panama Canal Zone, February 9. Departed Balboa, February 12, and occupied remaining 11 stations. A 24-hour stop was made at Santa Maria Island, Galapagos, on February 23. Finished last station February 27, and arrived at Los Angeles Harbor March 10.

<u>Fishing:</u> At each station forty baskets of sardine-baited long-line gear

were set commencing at 0600 hours. Sets were usually completed by 0745 hours. Two depths were fished by using 5- and 15-fathom float lines. Surface trolling was carried on along the long-line set while the gear soaked and while under way for the next station. Retrieving the long-line gear commenced at 1230 hours and was generally completed by 1445 hours. The vessel then proceeded to the next station 120 miles away.

Results: During the cruise 29 long-line stations were occupied, and a total of 44 yellowfin and 43 big-eyed tuna were caught (see chart). Four of the stations produced 77 percent of the total catch with the yellowfin catch concentrated in an area encompassed by latitude 8° -12 N. and longitude 87° -91 W. The heaviest of the catch of 3.89 yellowfin a hundred hooks occurred at lat. $10^{\circ}04^{\circ}$ N. and long. $90^{\circ}38^{\circ}$ W.

The big-eyed were caught at widely-scattered locations in the area encompassed by lat 2 N. to 2 S. and long. 83° to 92° W. One station at lat. 1 S8' N., long. 83° 09' W., produced the best catch of the cruise. This station yielded 29 big-eyed and 1 yellowfin for a rate of 6.89 fish a 100 hooks. This was also the only station at which the two species were taken together. Other catches included 122 spearfish, 143 sharks, 57 dolphins, and 6 miscelaneous species.

Surface trolling on long-line stations produced only one small yellowfin. Surface indications of tunalike fishes were observed on two occasions at long-line stations: A school of large yellowfin, observed near the long-line set atlat. 7 58 N., long. 90 37 W., and was thought to have been responsible for the yellowfin catch on that station. Several small schools of frigate mackerel were observed near the long-line set at the station of heaviest catch. The total troll catch consisted of 731 yellowfin tuna, 20 black skipjack, 5 dolphin, 2 bonito, 1 sailfish, and 1 oceanic bonito.

The catches on this cruise were, in general, consistent with those of Cruise 55-S-5 in regard to occurrence of fish. In the number of fish caught, however, there were far fewer big-eyed tuna caught on the latest cruise.

Oceanographic Observations: Bathythermograph casts and surface salinity samples were taken on each station and at 1800, 2100, and 0200 hours while under way between stations. Surface water temperatures were taken at regular intervals both on station and under way. A recording fathometer trace was kept in areas between stations where charts showed few or no soundings.

Positions were computed for each end of the long-line gear at setting and retrieving; these were to be used for drift calculations.

Bathythermograph casts off Central America indicated a shallow thermocline, the shallowest being 30 feet. Thermoclines off Ecuador and the Galapagos were generally deeper and were markedly different than those off Central America. A shoal area with a minimum depth of 405 fathoms was located in the vicinity of lat. 5 38 1 N., long. 88° 26 1 W. The surrounding depths were in the range of 1500 to 1600 fathoms.

Surface water temperatures in areas fished ranged from 22.7° to 27.6° C.

Biological Activities: All tuna brought aboard were measured and their stomach contents examined. Gonad development was also noted. Several stomachs and ovaries were collected for study ashore. Gonad and stomach examinations were also made of other species brought aboard. Complete records of long-line and troll catches were kept, along with a bridge record of marine-life sightings. A standard oblique plankton tow (450 meters of cable out) was made at each long-line station and at 2100 hours each evening between stations. An hour of collecting with a dipnet under a light suspended over the water followed the evening plankton tow. Biological observations included the following:

1. Size composition: A majority of the long-line yellowfin catch was centered about a mode of 100 cm. fork length. Two minor size groups of small and very large fish were also caught.

There were two defined groups comprising the big-eyed catch; averaging $98\,$ cm., and $174\,$ cm.

- 2. Sexual maturity: Many yellowfin in the 100 cm. group and larger were in a ripe or ripening state of maturity. All big-eyed showed little or no development.
- 3. Stomach contents: Examination of stomach contents revealed that squid, octopi, and swimming crabs made up the bulk of the food of both yellowfin and bigeyed. Snake mackerel (Gemphylus serpens) were fairly numerous in bigeyed stomachs at two stations.
- 4. Tagging: Near Acapulco, Mexico, 22 troll-caught yellowfin were tagged and released with spaghetti-type tags.
- 5. Marine life sightings: Numerous schools of yellowfin tuna were sighted in the vicinity of Cape Corrientes, Mexico. Small scattered schools of skipjack were quite numerous near Cape Mala, Panama. On the night of January 18, 1956, in the vicinity of lat. 15°35' N., long. 94°48' W., a large area of flipping lanternfish (Benthosema pterota) was passed through by the vessel for at least 5 miles and probably more.

In general much more marine life $was\ \mbox{encountered}$ near shore than in outlying waters.

6. Specimen collections: A variety of marine-life collections was made under the night light, from the stomachs of long-line fish, and during a stop at Santa Maria Island, Galapagos. These collections are in the process of being identified at this time. Larvae of yellowfin and black skipjack taken off Costa Rica have been thus far identified.



Alaska

IMPROVED TRANSPORTATION PROMOTED BY INTERIOR DEPARTMENT: The U. S. Department of the Interior will continue to promote seatrain service to Alaska, in the interest of reducing Territorial transportation costs, even though the new service may cause some change in existing trade channels, Secretary Douglas McKay stated March 20. On the other hand, the Department will not discriminate between rail and motortruck transportation in spite of its ownership of the Alaska Railroad.

For many years, students of Alaska economic problems have pointed to high transportation costs and inadequate service as principal obstacles in the way of developing Alaska's resources. The Department has been doing everything it can to bring those costs down. The proposed trainship is one step in that direction.

In the fall of 1955, rate reductions were made on certain types of quantity shipments on the Alaska Railroad, and this year no increases have been made similar to those granted to the stateside railroads. The Department is sponsoring an action before the Interstate Commerce Commission to eliminate stateside rail-rate discriminations against Alaska, the so-called Export Rate Case.

The trainship service involves provision of roll-on, roll-off car-ferry operation to Alaska on two vessels proposed to be built by a private ocean carrier, the Alaska Steamship Company, provided financing and other arrangements can be made. Whittier was selected as the Alaska terminus in a joint decision of the Alaska Steamship Company and the Alaska Railroad because of the comparatively short haul and moderate grades to Anchorage. The shipping company has guaranteed to continue to serve other Alaska ports, even if the seatrain service is provided.

In discussing truck transportation, it is pointed out that the Department has charge of most highway construction and maintenance in the Territory, through the Alaska Road Commission. The Department has been pleased to note the rapid development of trucking in Alaska during recent years, and intends to continue tofoster it in any way possible.

With respect to Alaskan ports competitive with Whittier, the Department has completed a paved highway from Seward to Anchorage, and is fast developing a hard-surfaced network of through roads from Valdez to interior points. In addition, large sums have been expended on rehabilitation of the Alaska Railroad line from Portage to Seward, and on new dock facilities at Seward. With cheaper and better transportation, Alaska will continue to grow in population and wealth as it should.



Cans--Shipments for Fishery Products, January-February 1956



Total shipments of metal cans for fishery products during January-February 1956 amounted to 9,841 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 9,353 tons in January-February 1956. Fish canning in January-February 1956 was confined largely to tuna and oysters, and the increase was

<u>principally due to a spurt in tuna packing</u> operations early this year.
Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Farm Fish Ponds

A one-acre fish pond--well-managed, properly fertilized, and adequately fished--will yield an annual harvest averaging 20 pounds of fish each year and provide 400 hours of good fishing, the U. S. Fish and Wildlife Service announced April 15. In the United States there are more than 1.5 million farm ponds of varying sizes but averaging an acre apiece. Many more ponds are being made each year through soil conservation and waterstorage projects.

In 24 states, laws and policies prohibit stocking of farm ponds with fish produced in the state hatcheries. The U. S. Fish and Wildlife Service has been called upon to fill that gap and each year provides more than 30 million fish, mainly warm-water species, for approximately 28,000 noncommercial ponds in 42 States.

Many of these are multipurpose ponds created as part of the Federal Soil Conservation and Watershed Protection program. The fact that the Federal Government and many states furnish the appropriate kind and



Farm fish pond,

number of fish for stocking, plus the knowledge that information on the development and management of ponds is readily available, has greatly stimulated the pond-construction program.

Interest in farm ponds is steadily increasing. The idea, which "took hold" first in the Southeastern States (where almost half the ponds are located) has spread to other sections of the country where topography and climate make these small fishing areas practical. They have a direct value in providing family fishing and at the same time they relieve fishing pressure on natural fishing areas.

Ponds smaller than a half acre rarely furnish good fishing, but ponds of from one to three acres are ideal for the average family and friends. Larger fishing ponds require more management, effort, and expense; however, they do produce a bigger crop of harvestable fish. These large ponds should be opened to public fishing because the quality of the sport is generally improved, never harmed, by heavy recreational fishing. Intensive cropping is an asset in the management of successful fish ponds.

To produce gratifying fishing, a farm pond must be well constructed on a favorable site, properly stocked, and must receive continuing management. Small fishing ponds should be stocked only with hatchery fish of the species, sizes, and numbers recommended for the area by state or Federal biologists. Promiscuous introduction of wild fish, either before or after stocking with the approved hatchery fish, is a common cause of poor fishing.

During 1954 the U. S. Fish and Wildlife Service distributed a total of 46 million eggs and 164 million fish varying from fry to catchable size. Of these 58 million were fry and fingerlings of warm-water species distributed to farm ponds and nearly 1,200 lakes and reservoirs.

Federal Aid to States Increases Gamefish Supply

A permanent additional supply of gamefish amounting to more than 1 million pounds a year has been provided by the manmade lakes created with Federal assistance, the Interior Department announced April 13. U. S. Fish and Wildlife Service experts predict that each of the nearly 8,000 acres of public fishing waters so far completed under the Federal Aid program may be expected to produce at least 150 pounds of gamefish annually.

The first Federal Aid lake was completed in 1953, a 32-acre impounded area on Virgin Run, near Pittsburgh, Pa. The latest and largest is Arkansas' Atkin Lake, 652 acres of water backed up behind a dam 2,500 feet inlength.

These fishing waters and 79 others like them have been built by the respective States with the help of Federal funds (Dingell-Johnson) made available by the U.S. Fishand Wildlife Service. The fish restoration money involved comes from a Federal excise tax on sport fishing tackle. Since important waterfowl and fur-animal usage is ex-

pected to be made of 22 of the lakes, some of the money was made available under the Pittman-Robertson Act which levies an excise tax on sporting arms and ammunition to provide funds for game restoration projects. The 81 lakes are located in 27 States and represent a total of 7,908 acres of new fishing waters. The cost of these new areas averages from \$1,000 to \$3,000 per acre of water.

Federal participation in the lake construction program is new. Only nine lakes have been fished for two years and some of them are storing their first water. But the possibilities are clearly indicated by the early returns. On the lake created at Oak Mountain State Park in Alabama, where a dam 825 feet in length impounds 250 acres of fine angling water, 2,308 fishermen caught more than 5,000 pounds of bass and sunfish in three days. On Yellowstone Lake in Wisconsin, where 456 acres of water accommodate thousands of anglers every week, a sample of 226 fishermen shows 1,661 fish in the creel with a catch rate of 3.2 fish per hour. Approximately one-half fish an hour is considered good fishing while an average catch of one fish an hour is considered excellent.

Arizona's Luna Lake, while only 32 acres in extent, has had a terrific economic impact on the adjacent town which has become a hustling meca for anglers.

Of the 81 lakes created to date, 22 are set up for joint use by fish and water-fowl. On the other 59 any waterfowl use is merely incidental. Many of the lakes have other values--but these values are subordinate to the whip of the fly when fishing season is open. No other use is permitted to damage the fishing values of the waters.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPART-MENT OF DEFENSE, MARCH 1956: A total of 2,198,000 pounds (valued at \$1,106,000) of fresh and frozen fishery products for the use of the U. S. Army, Navy, Marine Corps, and Air Force were purchased in March 1956 by the Army Quartermaster Corps. This was 32.5 percent more in quantity and 30.1 percent more in value

Purch	Purchases of Fresh and Frozen Fishery Products by					ts by		
Department of Defense (March and the First								
1	3 M	onths of	1956 w	ith Cor	nparisc	ns)		
	QUAI	YTITY		VALUE				
Ma	rch	JanI	March	March JanMa			March	
1956	1955	1956	1955	1956	1955	1956	1955	
		ounds)		(\$1,000)				
2,198	2,606	4,943	6,444	1,106	1,151	2,702	[2,765]	

than purchases the previous month, but 15.7 percent less in quantity and 3.9 percent less in value than purchases in March 1955.

For the first three months in 1956, purchases of fresh and frozen fish amounted to 4,943,000

pounds (valued at \$2,702,000) -- a drop of 23.3 percent in quantity and 2.3 percent in value as compared with the same period a year earlier.

Prices paid for these fishery products by the Department of the Defense in March 1956 averaged 50.3 cents a pound as compared with 51.2 cents a pound the previous month and 44.2 cents a pound in March 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces generally make some local purchases which are not included in the data given above. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.



Fur-Seal Skins

PRICES DOWN SLIGHTLY AT SPRING AUCTION: Fur-seal skin prices were lower by about 3.2 percent from the 1955 fall sale, but total revenue increased because of a greater volume at the semiannual auction of Government-owned fur-seal skins at St. Louis on April 16, 1956.

A total of 27,017 skins, products of the sealing industry administered by the U. S. Fish and Wildlife Service on the Pribilof Islands, Alaska, brought \$2,519,994. This compares with 24,610 skins sold for \$2,316,735 at the October 10, 1955, sale. The grand average for all skins sold for the account of the United States Government was \$93.27; at the October 1955 sale it was \$94.14.

Of the Alaska skins, 16,193 were dyed "matara" (brown), 1,705 were "safari" brown (a lighter brown), and 9,119 were blacks. The matara skins brought an average of \$90.58, a decline of 4,8 percent below the October auction. The safari skins sold for an average of \$65,90, a decline of 7.6 percent. The black skins averaged \$103.18, virtually unchanged from last October's price of \$103.46.

In addition to the United States skins, 4,525 Cape of Good Hope fur-seal skins were sold for the account of the Government of the Union of South Africa at an average of \$26.94, a decline of 12.1 percent from the last sale. A total of 450 Uruguay



Fur-seal cow and bull with pups in background at U.S. Government Reservation, St. Paul Island, Alaska.

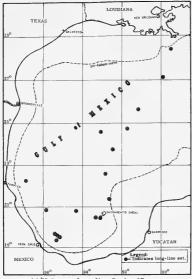
fur-seal skins were sold for the Government or Uruguay at an average of \$45.12, a slight increase over last October's price of \$44.30.



Gulf Exploratory Fishery Program

LONG-LINE YELLOWFIN TUNA TRIP SUCCESSFUL (Cruise 37): Over 26 tons of yellowfin tuna were caught by the Service's exploratory fishing vessel Oregon on 17 sets averaging 59 baskets (590 hooks) each in the southwestern Gulf of Mexico during cruise 37 (March 22-April 17). Highest catches were made in the southeastern Gulf of Campeche off Sacramento Shoal. An 80- and 91-basket set in this area on April 13 and 14 caught 103 and 117 yellowfin tuna, respectively, with a total weight of 25,431 pounds (12.8 yellowfin/100 hooks). Catch rates on the four sets in other areas of the Gulf of Campeche outside of the 1,000-fathom curve averaged 5.0 yellowfin/100 hooks. The remaining 11 sets were made in the central and southwestern Gulf and caught $4\frac{3}{4}$ tons of yellowfin at an average rate of 1.5 fish/100 hooks.

In addition to the yellowfin catch, 10 bluefin tuna (average weight of 339 lbs.), 1 skipjack, 10 white marlin, 3 blue marlin, 1 swordfish, and 63 sharks were caught; 80 yellowfin, 1 bluefin, 4 white marlin, and the 3 blue marlin were tagged and released. Approximately 13 percent of the yellowfin catch was damaged by sharks.



M/V Oregon long-line Cruise 37.

Most of the sets were made in moderately heavy seas restricting the amount of gear that could be used. All sets caught yellowfin with the exception of one on the northern edge of the Sigsbee Deep. Two large schools of blackfin and one small school of 60- to 70-pound yellowfin were observed during the cruise. Bathythermograms were obtained at the beginning and end of each set.

The <u>Oregon</u> was scheduled to leave Pascagoula on May 1 to carry out three weeks of deep-water shrimp exploration in the north-central and northwestern Gulf of Mexico. The primary objective of this trip was to be to conduct extensive coverage of the 200- to 300-fathom area off the Texas coast using 40-foot flat trawls. If significant quantities of shrimp are located, production-type dragging will be carried out using 80-foot balloon and 100-foot flat trawls.

At the request of several members of the Gulf shrimp industry, a series of exploratory drags will be made for brown-grooved shrimp in depths of 40 to 75 fathoms along the Louisiana and Texas coasts between the Mississippi Delta and Aransas Pass, Tex.



Maine

SARDINE CANNERS PREPARE FOR 1956 SEASON: Most of Maine's 40 sardine canning plants are being put in readiness for the official opening of the season on April 15, but activity will be light until mid-May unless the herring appear earlier than they have for the past 10 years.

Data released by the Maine Sardine Industry's Executive Secretary on April 7 revealed that the average date for a sizable run of fish on any section of the coast for each year since 1945 was May 15. Some activity got under way on May 1 in 1954 and 1955, while it was early June before packing started generally in 1947 and 1948.

Hopes for an early run of fish in eastern Washington County (Eastport area) have diminished somewhat due to the erratic behavior of some large schools that were in evidence for most of the winter.



Sardine boat unloads at a cannery in Maine.

The Industry spokesman said that most companies were eager to start canning as the industry's inventories were at the lowest ebb since the war years. He states: "There is a virtual sell-out of the small 1955 pack of 1,250,000 cases plus the large carry-over from 1954 and most packers are pressed to supply their customers."



Maine Sardines

CANNED STOCKS, APRIL 1, 1956: Distributors' stocks of Maine sardines amounted to 268,000 actual cases as of April 1, 1956; 63,000 cases (or 19 percent) less than on April 1 a year ago. April 1, 1956 stocks were 58,000 cases less than on January 1, 1956, according to estimates based on the results of a series of measurements for the 1955/56 marketing season by the U. S. Bureau of Census.

Canned Maine SardinesWholesale Distributors' and Canners' Stocks, April 1, 1956, with Comparisons									
C Ct - l-	1955/56 Season 1 1954/55 Season								
Type of Stocks	Unit	4/1/56	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54
Distributors	1,000 actual cases	268	326	354	235	n.a.	331	n.a.	n.a.
Canners	1,000 standard cases1/	152	475	625	723	575	715	1,239	1,410
1/100 3 1 oz. cans equ	al one standard	case.		n.a not	available,			***************************************	

Canners' stocks as reported by the Maine Sardine Industry amounted to only 152,000 standard cases (100- $3\frac{1}{4}$ oz. cans) on April 1, 1956. Canners' stocks on April 1, 1955, were 715,000 standard cases, and on January 1, 1956, totaled 475,000 cases.



Market Outlook for Fishery Products

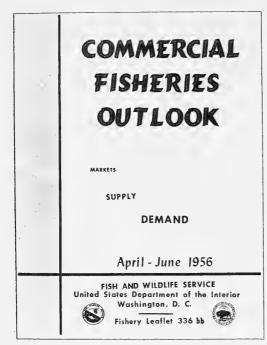
APRIL-JUNE 1956: The fresh fish season is on and for the next six months consumers will have greater freedom of choice between fresh, frozen, and canned fish in markets throughout the country, according to the Commercial Fisheries Outlook, April-June 1956, Fishery Leaflet 336bb, issued by the U.S. Fish and Wildlife Service on April 16.

While some fishing is done in every month of the year, the big harvest begins in the second quarter with several major fisheries reaching peak production during that period.

The North Pacific halibut fishermen begin their season in May and expect to be at peak production by the end of June. Prices probably will be a little higher on the new catch because of light stocks. Salmon are being landed now, but early landings were light as usual for the time of year. The trolling season in Washington and Oregon began April 15. Troll-caught salmon in Alaska find a ready market also.

Good seasonal supplies of fresh mackerel, whiting, bluefish, sea bass, shad, scup, striped bass, mullet, red snapper, and haddock will be available at their usual markets at prices dependent upon local supply situations.

 $\label{eq:production} \textbf{Production of shrimp will also increase with a steady market and good demand \\ \textbf{expected.}$



Fresh-water fish landings of bullheads, catfish, buffalofish, carp, smelt, whitefish, yellow pike, and others will be at about the usual level for this time of year. The market for shellfish is generally steady, supplies ample, and demand good.

Cold-storage holdings of salmon are down in the United States and Canada, the demand is good, and prices will probably remain above normal. Canned salmon supplies are practically exhausted and the demand far exceeds the supply. Canning of salmon in Bristol Bay, Alaska, will start June 25.

The tuna industry is getting off to a good start. Domestic landings in the first quarter were nearly twice the landings of the like quarter in 1955 but some of this increase was due to delayed unloadings. Albacore, or white-meat tuna, continues in short supply. However, other kinds of tuna are plentiful. Demand is usually good in the summer.

The Maine sardine packing season began April 15. A better pack is expected than in 1955.

Menhaden landings will reach a peak in the South Atlantic and Gulf States area during the quarter and the demand for fish meal and oil is expected to continue strong.

Fish-stick and other packaged fish and shellfish producers will be attempting to expand markets by overcoming price competition which has hampered promotional efforts.

Marketing Prospects for Edible Fishery Products, Spring-Summer 1956

Total supplies of edible fishery products were expected to continue somewhat lower this spring than last, particularly for the canned commodities. Retail prices for fishery products this spring were expected to average a little higher than a year earlier.

Supplies of fresh and frozen fishery products were expected to increase during the summer months as commercial fishing operations expanded seasonally. Total commercial freezings of fish and shellfish probably were expected to reach a peak between late spring and midsummer. Imports of frozen groundfish (including ocean perch) fillets and blocks were expected to continue larger than a year earlier through the summer.

The smaller supplies of canned fishery products this spring than last reflect smaller 1955 packs of salmon and Maine sardines than in 1954. There was no likelihood of much improvement in the canned fish supply situation at least until about midsummer, when the 1956 packs would start moving to market in volume. Except for tuna, the production season for the important canned products is from late spring until about midfall. Tuna is canned the year round. It is still too early to forecast the size of the 1956 canned fish pack because of the great uncertainty as to the availability of fish during the canning season.

Civilian per capita consumption of fishery products this spring and early summer probably would be a little lower than a year earlier. This was expected to reflect mainly the lower supplies and somewhat higher prices in prospect.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's May 1, 1956, release of The National Food Situation (NFS-76).

North Atlantic Fisheries Exploration and Gear Research

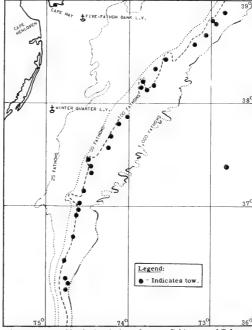
FISHERIES RESOURCES ON EDGE OF CONTINENTAL SHELF SURVEYED BY "DELAWARE" (Cruise 17): The Service's exploratory fishing vessel Delaware re-

vey of the fishery resources in deep water on the edge of the Continental Shelf offshore from New Jersey to Virginia (see chart). Large schools of spiny dogfish (Squalus acanthias) were encountered on the 11-day trip, with the largest single tow yielding close to 12,000 pounds.

Common lobsters (Homarus americanus) were found to be widely distributed over the area surveyed, but were not caught in large quantities. Other varieties taken during the trip included the deep-water red crab (Geryon sp.), white hake (Urophysis tenuis), and whiting (Merluccius sp.)

The vessel made 27 tows with a standard No. 41 otter trawl equipped with 20-fathom ground cables and 45 feet of rollers. All tows were of one hour duration; $1\frac{1}{2}$ days were lost due to stormy weather.

The <u>Delaware</u> is scheduled to leave its East Boston base on April 9 to continue the survey of the deep-water fishery resources on

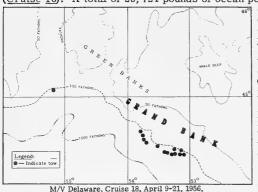


The area surveyed by the Service's exploratory fishing vessel Delaware (Gruise 17).

the edge of the Continental Shelf. The area to be surveyed will be near the Grand Banks, south of Newfoundland.

* * * * *

OCEAN PERCH EXPLORATORY FISHING ON GRAND BANK BY "DELAWARE" (Cruise 18): A total of 25, 724 pounds of ocean perch (Sebastes marinus) was taken



on the western edge of Grand Bank during Cruise 18 of the Service's exploratory fishing vessel <u>Delaware</u>. The fish was taken in the 150- to 400-fathom depth range, with the largest single one-hour catch amounting to 5,052 pounds. Contrary to expectations, the ocean perch taken were of very small size, ranging from 0.6 to 1.1 pounds in weight. Previous cruises in the Sable Island area, to the westward, had yielded ocean perch two to three times as large from deep water.

High wind and snow permitted completion of only 14 tows in deep water during the 13-day cruise,

which ended April 21. A standard No. 41 otter trawl was used.

The $\underline{\text{Delaware}}$ was scheduled to leave April 30 to continue exploration for deepwater lobster at the edge of the continental shelf.



North Atlantic Fisheries Investigations

DISTRIBUTION OF HADDOCK EGGS AND LARVAE STUDIED BY "ALBATROSS III" (Cruise 72): The distribution of haddock eggs, larvae, temperature and salinity, and the general circulation pattern in the Gulf of Maine were studied during a tenday cruise (March 21-31) by the Service's research vessel Albatross III.

The 2,000 miles of continuous plankton tows at the surface and at ten-meter depths resulted in the finding of haddock, cod, gray sole, and sea dab eggs. In addition, herring, cod, pollock, and ammodytes (sand launce) larvae were found. The haddock eggs were found principally over the southeast part of Georges Bank.

Oceanographic data was collected by 190 bathythermograph lowerings and 90 salinity samples, and additional biological data by 14 surface tows with the standard meter net. Eight samples of eggs were hatched for identification purposes and 624 drift bottles were released throughout the area of the cruise. The surfacetemperatures encountered during the trip were the lowest in recent years.



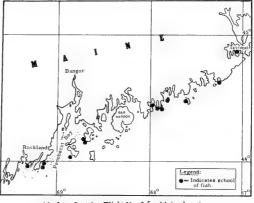
North Atlantic Herring Research

AERIAL SURVEYS OF MAINE HERRING SCHOOLS STARTED (Flight No. 1): An aerial survey was made by the U. S. Fish & Wildlife Service of coastal waters

from Eastport, Me., to Muscongus Bay. All bays, rivers, and inlets were thoroughly covered. The objectives of this survey were as follows:

- 1. Locate any schools of herring present along the coast.
- Evaluate the possibilities of this method of surveying as an aid to the research program on herring.

The aircraft used was a fourplace Cessna 172. The survey was made in two flights from the Bar Harbor Airport. The first flight was from Bar Harbor to Eastport and return, and the second flight was from Bar Harbor to Muscongus Bay and return. It was planned to cover the



Airplane Spotting Flight No. 1 for Maine herring.

coast from Muscongus Bay to Portland on a third flight, but unfavorable weather prevented this. Movies and still pictures were made of the various methods of constructing and locating herring weirs along the coast.

Observable indications of fish schools in the water were noted at several localities shown on the accompanying chart which were believed to be schools of herring. However, positive identification could not be made.

Survey plans for 1956 call for the use of a seaplane for herring spotting, both in cooperation with a Service surface fishing vessel and to assess the availability of herring in the inshore areas and to note the major school-group movements in the fishery.



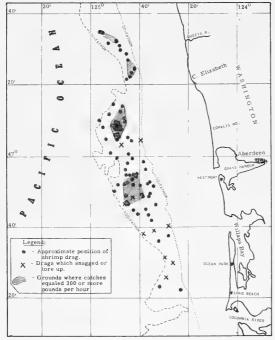
North Pacific Exploratory Fishery Program

GOOD PINK SHRIMP CATCHES REPORTED BY "JOHN N. COBB" (Cruise 26): Good catches of "cocktail-size" pink shrimp (Pandalus jordani) were made off the coast of Washington by the Service's exploratory fishing vessel John N. Cobb during a four-week cruise which ended on April 20. Best fishing areas yielded shrimp at the rate of 2,000 pounds per hour off Grays Harbor, and fairly consistent catches of 500 pounds or more per hour were made in several areas with a Gulf of Mexico shrimp trawl.

This was the second shrimp exploration off the Washington coast conducted by the Service in cooperation with the State of Washington Department of Fisheries. The first trip in the fall of 1955 revealed that the shrimp beds extended over a wide area from off Willapa Bay to off Cape Johnson principally at depths between 50 and 100 fathoms.

The second trip showed excellent prospects for development of a commercial shrimp fishery off the Grays Harbor area. Most productive depths were from 65

to 85 fathoms both north and south of the entrance to Grays Harbor on green mud bottom. In order to test commercial possibilities in one of the better areas, the



M/V John N. Cobb, Cruise No. 26 (March-April 1956).

John N. Cobb made a series of "production" drags over a 6-hour period approximately 26 miles true west of Copalis Head on April 18. From 6 a.m. to noon, seven 30-minute drags at 74 to 79 fathoms produced a total of 5,210 pounds of shrimp. Random samples from these catches ranged from 110 to 122 whole (headson) shrimp a pound.

A total of 94 drags, mostly of one-hour duration, were completed during the trip at depths of 48 to 138 fathoms from off Long Beach to Destruction Island: 51 drags were made with a 40-foot Gulf of Mexico shrimp trawl having a $1\frac{1}{2}$ -inch mesh cod end, 39 with a 20-foot beam trawl, and 4 with a small-mesh Western otter trawl.

The Gulf shrimp trawl, used for the first time in this region as far as is known, proved to be from two to three times as efficient as the beam trawl. The gear caught only small amounts of fish, mostly species not considered as food fish, such as skates, ratfish,

turbot, etc. The Gulf trawl was fished from one trawling cable on a 25-fathom bridle, a method easily adaptable to small commercial vessels in the 50- to 60-foot class.

Night fishing on two different occasions resulted in very small catches on identical grounds where good shrimp catches were made during the day.

An experiment in holding the fresh whole pink shrimp on ice was carried out aboard the $\underline{John\ N}$. \underline{Cobb} over a 6-day period. Although final technological tests are not yet completed, preliminary examination indicates that the shrimp can be held several days on ice with no apparent damage to the meat. The fresh shrimp peeled easily after being held in ice at least 24 hours.

A biologist from the Shellfish Division of the Washington State Department of Fisheries participated in the cruise, and numerous samples of shrimp were frozen for biological analysis at the State laboratory at Aberdeen.

One commercial vessel out of Westport started to fish the shrimp grounds and had boated several catches before the John N. Cobb left the area.



Pacific Oceanic Fishery Investigations

TAGGED ALBACORE TUNA RECAPTURED AFTER LONG MIGRATION: The fact that albacore tuna range over vast distances in the Pacific was proven by the recapture of a 40-pound albacore tuna tagged 1,300 miles north of Hawaii, October 5, 1954, by the U. S. Fish and Wildlife Service and recaptured in January 1956 near Japan, 2,370 miles away. The albacore tuna weighed 15 pounds when tagged.

The recovery may be of extreme importance to the tuna fishing industry. It is additional evidence that the albacore tuna of the North Pacific may belong to a single population which migrates between America and Japan. It is not conclusive,

however, because this is only the second instance in which an American tagged albacore has been taken in Japanese waters. The first such instance was about three years ago when an albacore tagged off the California coast was taken near Tokyo.



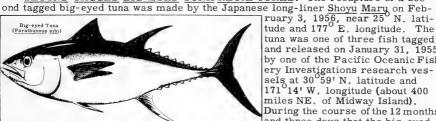
It was also reported that another tagged tuna had been re-

captured. This one, a 7-pound skipjack, tagged close to the Hawaiian shore was taken 252 days later only 30 miles away. It had doubled in weight in the interim.

The tuna migration study is one of many being conducted by the Pacific Oceanic Fishery Investigations unit of the U.S. Fish and Wildlife Service. Its purpose is to find out as much as possible about the life history of the fish so as to be able to predict abundance, probable best fishing seasons and locations, and to get other information which will aid the industry to develop new high-seas fisheries.

Fishing for the albacore, which has the whitest meat of all tunas, is a valuable segment of the tuna industry. However, its variations in time and place of appearance along the North American coast presents commercial albacore fishermen with more than the usual number of problems. There are several thousand tagged albacore in the Pacific Ocean now and Service scientists hope that tuna migrations will be clearly defined in the future.

* * * * SECOND TAGGED BIG-EYED TUNA RECAPTURED: The recapture of a sec-



tuna was one of three fish tagged and released on January 31, 1955, by one of the Pacific Oceanic Fishery Investigations research vessels at 30°59' N. latitude and 171°14' W. longitude (about 400 miles NE. of Midway Island). During the course of the 12 months and three days that the big-eyed

tuna was in the water, it had traveled nearly 750 miles in a southwesterly direction and gained 35 pounds in weight. The first recovery (also tagged on January 31, 1955) was made by the Japanese long-liner Nikkon Maru on November 24, 1955, about 800 miles east of the release point and the fish had gained about 10 pounds in weight.

Note: See Commercial Fisheries Review, February 1956, p. 25.

* * * * *

STUDY OF LONG-LINE SHARK CATCH COMPLETED: A study of the catch per unit of effort for long-line-caught sharks made during cruises of the Pacific Oceanic Fishery Investigations research vessels was completed in March 1956. The analysis of the data, seasonally and geographically, indicates that of the six species captured most frequently, two (the white-tip and brown) are equatorial and moderately abundant, one (the bonito shark) is wide-ranging but uncommon, another (the great blue shark) is wide-ranging and very abundant in cold water, a fifth (mackerel shark) is limited to cold water, while a sixth variety (thresher shark) may have longitudinal restrictions.



Public Eating Places Survey

MENU PRICES FOR DINNERS IN PUBLIC EATING PLACES: In almost two-thirds of United States public eating places serving fish and shellfish, the dinners bought most often cost less than one dollar. This fact will be of interest to fish distributors who may note that restaurants customarily don't spend more than 20



percent of the plate or menu price for the major ingredient. About 22 percent of the establishments indicated that the dinners they sold most often were priced between \$1 and \$2. Relatively few (less than 8 percent) of the establishments sold more dinners priced at \$2 or over than any other price category. These figures are based on a scientific sample survey of approximately 4,500 public eating places. For the nation as a whole, 65 percent of the restaurants as compared with 91 percent of the cafeterias sell dinners of less than \$1 more often than dinners of over \$1.

For hotels which operate restaurants and cafeterias, the most frequent price of the dinner bought was between \$2 to \$4.

This price category for dinners was reported by 41 percent of the hotel eating places as compared to a national average of 7 percent of all the establishments.

Regionally, the distribution of responses as to the price of dinner bought most often varies only slightly except in the West. The West, when compared with the other regions, included proportionately more restaurants and cafeterias which sold the higher-priced dinners between \$1 and \$4.

Public eating places when grouped by annual dollar sales showed an interesting relationship between annual sales and the number of eating places serving higher-priced dinners. Restaurants and cafeterias in the higher annual sales bracket reported the expensive dinners more often.

This study on the consumer's cost of dinners bought most often is one part of a broader study of fish and shellfish consumption characteristics in public eating

places. The Fish and Wildlife Service contracted with the Bureau of the Census to conduct the survey with funds provided by the Saltonstall-Kennedy Act of 1954.

Percentage of Public	Eating Pl						the United	States			
				Menu Cost of Dinners							
	Tota	ıl	Less Than \$1			Over \$4	More Than One Dining Facility	Served	No Answei		
United States total	<u>No.</u> 208, 100	% 100.0	% 62.3	21.9	% 7.1	0.5	0.8	<u>%</u> 5.4	2.0		
Region: Northeast North Central South West	45,900	100, 0 100, 0 100, 0 100, 0	66.5 67.3	22.1 19.4 19.1 29.9	8.7 5.9 3.7 10.7	0.7 0.2 0.4 0.9	1.0 0.5 0.4 1.2	4.0 4.7 7.6 6.3	1.5 2.8 1.5 2.0		
Type of Establishment: Restaurants Cafeterias Restaurants or cafeterias		100.0	90.7	26.5 7.0	6.2	0.6	0.2	0.4 2.3	0.6		
in hotels Drug or proprietary stores with fountain Other1/	9,800	100.0 100.0 100.0	81.6	30.7 3.1 16.8	41.2 - 2.6	0.1	7.2 2.0 0.1	8.2 13.0	2.6 5.1 3.6		
City SizePopulation: 500,000 or more	27, 400 39, 900	100.0 100.0 100.0 100.0	71.3 65.0 65.2	18.8 11.5 17.5 24.6 27.7	8.7 6.9 6.6 3.5 8.5	1.4 0.4 0.7 0.3	1.6 2.3 0.4 0.2 0.1	2.1 3.8 9.5 4.5 6.8	2.6 3.8 0.3 2.0 1.5		
Annual Sales: \$100,000 or more \$40,000 to \$99,999 \$10,000 to \$39,999 Less than \$10,000 No reply I Includes drinking places, lunch counters, ar	62,600 91,600 13,900	100,0 100.0 100.0 100.0	48.8 68.7 69.3	30.3 33.9 22.8 17.0 19.4	37.5 11.3 4.6 2.6 7.2	3.9 0.8 0.2	4.6 0.4 0.3 0.5	1.3 3.6 1.6 8.6 8.7	1.2 1.8 2.0 6.5		

Note: Also see Commercial Fisheries Review, February 1956, pp. 31-33.

* * * * *

POPULARITY OF FISH AND SHELLFISH IN PUBLIC EATING PLACES: Canned tuna was found to be the most popular fish in restaurants, cafeterias, and other public eating places in the United States and shrimp the most popular shellfish.

According to the recent U. S. Fish and Wildlife Service sample survey, tuna was served as the most popular species in 43,000 establishments out of 190,000 serving fish. Halibut vied with flounder for second place, while haddock, salmon, cod, ocean perch, pike, and catfish followed in popularity in the order given.

Shrimp was sold as the most popular shellfish in 112,000, or over 80 percent, of the 134,000 public eating places serving shellfish. Oysters were next in sales with scallops and lobsters a close third and fourth. Crabs and clams followed in fifth and sixth place.



The findings mentioned are based on a statistical sample of the number of establishments reporting their three most-often-sold species of fish and their three leading species of shellfish.

Ranking of the More	Popular Species	Sold in Pu	blic Eating Pl	aces Serv	ring
	sh and Shellfish			0 17	.07
Species Fish:	United States	Northeast	North Central	South2/	West2/
Tuna	1	1	9	10	3
Flounder	2	2	-	3	4
Halibut	3	4	8	-	1
Haddock	4	3	3	6	-
Salmon	5	5	7	9	2
Cod	6	6	6	4	5
Ocean perch	7		1	5	-
Pike	8	8	2	-	
Catfish	9	-	4	1	-
Swordfish	10	7	-	-	9
Yellow perch	11	-	5	-	-
Sea bass	12	-	-	8	7
Sea trout	13	-	-	2	-
Whitefish	14	-	10	-	-
Red snapper	15	-	-	7	-
Fish sticks3/	16	~	-	-	10
Lake trout	17	-	11	-	
Scup	18	9		-	-
Whiting (Jack salmon).	19	_	-	13	_
Sardines	20	10	_		
Brook trout	21		_	-	6
Spanish mackerel	22	_		12	
Bluefish	23	11	_		
Shellfish:					
Shrimp	1	1	1	1	1
Ovsters	2	6	2	2	
Scallops	3	0	4	5	2
Lobsters	3	2	3 .	4	5
Crabs	5	.5	3		4
	6	.5 4	~	3	3
Clams	7	4	-	-	6
Abalone				_	7
choice, 2/ Mullet ranked 11th in the South; roc			ist often sold as entire	r iirst, secon	a, or unra
3/ Includes more than one species of f	ish.				
Note: The data are a projection based	on the probability san	npling of 4,500 p	blic eating places.		

Differences in the rankings of the species of fish on a regional basis are most striking. Tuna ranked first in the Northeastregion, but dropped to ninth, tenth, and third place in the North Central, South, and Western regions, respectively. The more frequent sale of tuna in the Northeast region may be due to the larger proportion of drug stores, drinking places, lunch counters, and refreshment stands which normally serve tuna in salads and sandwiches. Flounder ranked second, third, and fourth in the Northeast, South, and West, respectively, but was insignificant in the North Central region. Halibut ranked first in the West and fourth and eighth in the Northeast and North Central, respectively,

but was not among the leaders in the South. Haddock was in third place in the Northeast and North Central, sixth in the South, but was not ranked among the leaders in the West. Salmon was second in the West and fifth, seventh, and ninth in the Northeast, North Central, and South, respectively. The ranking of cod was more uniform. It ranked fourth in the South, fifth in the West, and sixth in both the Northeast and North Central.

Shrimp outdistanced by a wide margin all other species of shellfish in the four regions in popularity. Oysters are the second most-often-sold shellfish in the North Central, South, and West, but, oddly enough, in sixth place in the Northeast. Scallops ranked second in the Northeast, fourth in the North Central, and fifth in both the South and West. Lobsters ranked third in the Northeast and North Central and fourth in the South and West. Crabs claimed third place in the South and West, fifth in the Northeast, and unranked in the North Central.

The U. S. Fish and Wildlife Service contracted with the Bureau of the Census to conduct the survey with funds provided by the Saltonstall-Kennedy Act of 1954.



Saltonstall-Kennedy Act Fisheries Projects

EFFECT OF LOGGING AND SEA LIONS AND HAIR SEALS ON ALASKA FISH-ERIES TO BE STUDIED: The effect which Alaska's new industry, logging for pulp production, will have upon its old industry, salmon fishing, will be the object of a special study, the Acting Secretary of the Interior announced March 22. The study will be made by the Fisheries Research Institute of the University of Washington under a contract signed by the U. S. Fish and Wildlife Service. The one-year contract provides for an expenditure of \$35,000.

It was also announced that the Fisheries Research Institute would make a study of the effect of Alaska sea lions and hair seals on the salmon and halibut fisheries. This contract is for \$20,000 and provides for a year's study.

Large-scale logging operations in the huge stands of virgin timber in Alaska are just beginning and the Service is concerned about any possible damage to salmon streams. As a result, the Service is seeking ways to protect the fishery against harmful effects which might occur. A field station is being established near Ketchi-

kan and detailed observations will be made of biological and physical changes resulting from the logging. Of particular interest will be the extent of silting in the stream bed and any changes in salmon runs and the success of spawning.

The damaging effect which the big sea lions and the hair seals have upon fishing gear in those northern waters is well known to the fishing industry, but the general effects on fisheries have not been measured. For some time these animals have been considered serious predators on salmon and halibut, but to what extent is not known. The U.S. Fish and Wildlife Service is asking that special attention be given to the locations of the rookeries



Sea lions on breeding grounds about 2 weeks after height of breeding season.

of these animals, the total populations, the trend in populations, and the food habits. The results of this study will be related to the findings of other studies on hair seal and sea lions made by the Institute.

These research projects are financed by the Saltonstall-Kennedy Act of 1954 which provides for the development of fisheries and markets for fishery products.

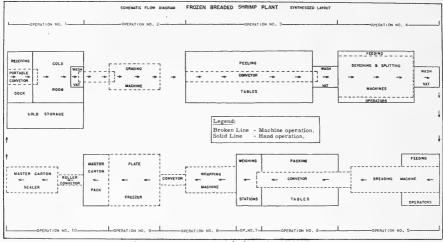


Shrimp

BREADED SHRIMP PLANT ENGINEERING SURVEY: Considerable savings in breaded shrimp production costs may be made by reorganizing plant layout using the existing facilities, according to a plant engineering survey in Florida and Georgia, made by the First Research Corporation of Miami, Fla., under the supervision of the U. S. Fish and Wildlife Service. The survey was financed by funds provided by the Saltonstall-Kennedy Act of 1954 to help the domestic fishing industry.

In a study of typical shrimp breading and freezing plants in Florida and Georgia, the plant engineering specialists found that all of the plants may have an opportunity to cut production costs by certain improvements in the arrangement of existing plant equipment. Almost without exception, rearrangement of the plant layout within the space available could offer labor savings through the reduction of transport which was considered excessive in some cases.

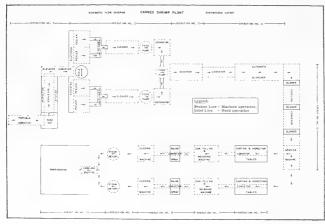
The man-hours expended in various operations were measured and compared by the engineers. A synthesized plan for a plant layout was developed for maximum efficiency using equipment and machinery in common use in the industry. This plan may be adjusted to the particular needs of the individual enterprise. In many cases the adoption of only some phase of the synthesized layout plan may offer real savings in man-hour costs.



Model engineering layout plan of a frozen breaded shrimp plant.

* * * * *

SHRIMP CANNERY COST-CUTTING OPPORTUNITIES: Canned shrimp plants are the most highly mechanized segment of the shrimp industry. Nevertheless, it is reported that about 85 percent of the total man-hours required to pack canned shrimp consist of hand operations. Opportunities may exist in the shrimp canner-



Model engineering layout plant of a canned shrimp plant,

ies to cut labor costs by saving man-hour losses created by crossover and backtracking in product flow, according to a survey made in Louisiana by industrial engineers of the First Research Corporation, Miami, Fla., under the supervision of the U. S. Fish and Wildlife Service. The survev was financed by funds provided by the Saltonstall-Kennedy Act of 1954.

Shrimp canners use proven machinery wherever possible in the production line, but recognize the need for further refinement of their mechanized equipment, according to the engineers of the First Research Corporation. The automatic peeling machines and automatic deveining machines introduced in recent years have greatly reduced manpower requirements. However, satisfactory machinery to perform sorting and inspection operations may be needed.

In connection with the survey, the industrial engineers developed a cannery layout plan for maximum efficiency using equipment and machinery now in common use in the industry. In many cases, the adoption of only some phase of the synthesized layout plan may offer real savings in man-hour costs.

A detailed description of the advantages of the model plan is available from the U. S. Fish and Wildlife Service, Washington, D. C.

* * * * *

STUDY OF FUEL CONSUMPTION BY GULF SHRIMP FLEET: Fuel consumption is one of the leading cost factors in vessel operation. Moreover, as compared

with such fixed expenses as insurance, depreciation, licenses, and interest charges, it is one of the few costs over which vessel operators have some degree of control. Fuel consumption for five shrimp vessels based in Key West and fishing the Tortugas grounds in 1954 ranged from 57, 4 gallons of Diesel fuel per day to 76.2 gallons. However, the same figures expressed in terms of the vessel's shrimp catch ranged only from 0.32 gallons per pound of shrimp caught to 0.37 gallons per pound.

The figures for Brownsville, Tex., expressed in terms of shrimp catch ranged from 0.3 gallons per pound of shrimp caught to 0.48 gallons. The fuel



Typical offshore trawlers tied to the dock at Morgan City, La.

consumption for Biloxi, Miss., expressed in terms of the vessel's shrimp catch ranged from 0,22 gallons per pound of shrimp caught to 0,29 gallons.

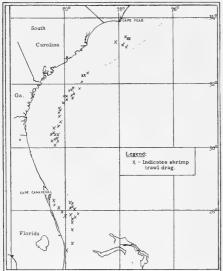
	Fuel	Cons	sumption	OnShrim	ip Vess	els: A	nnual,	Per	Day,	and Pe	r Pound	of Shr	imp Caught,	1954
	Tonn	age	Dimer	sions in	Feet		Eng	ine	N	et		nDec		Fishing
Vessel	Gross	Net	Length	Breadth	Depth	Year Built	Type	hp.	Size	Type	Total	Per Day	Per Lb. of Shrimp Caught	Grounds
						Key	West	. Flo	rida					
A B	26 22	11 8	44.8 41.1	16.0 14.2	6.3 5.9	1946 1948	D. D.	165 110	62' 62'	SB.	16,679 12,413	76.2 57.4	.37	ſ
C D	28 21	11 8	46.1 41.8	16.2 14.7	5.4 6.3	1943 1947	D. G.	100 165	62' 62'	SB. SB.	14,792 12,254	65.4 61.9	.35	Tortugas
E F G	48 65 63	33 29 28	52.8 61.6 58.7	15.9 18.4 18.5	8.3 8.4 8.2	1953 1953 1952	D. D. D.	165 165 120	65' 65'	SB. SB. SB.	15,887 9,430 8,602	68.7 134.8 108.8	$\frac{1}{1}/.34$	Campeche
			00.1	20.0	0.2		xi, M			DD.	0,002	100.0	.20	
H I J K	18 49 22 16	11 33 14 10	42.5 57.1 48.2 42.9	14.3 17.6 15.7 14.3	4.4 6.4 4.3 4.5	1944 1943 1942 1945	D. D. D.	110 120 77 83		B. B. B.	12, 481 16, 032 10, 780 8, 551	51.8 61.2 42.4 41.9	.29 .28 .23	Delta
	1 - 2 - 2		2010	11.0			nsvill			ъ.	0, 551	74.0	. 44	
L, MI	53 57	23 25	59.9 54.2	18.5 18.9	6.9 8.2	1951 1950	D. D.	120		F.	25,717 27,458		.48	1
N C	57 57	23 23	59.5 59.5	17.9 17.9	7.7	1951 1951	D. D.	120 120	861 861	F.	27, 822 24, 233	115.9 114.3	.33	Off Brownsville
0 P ₂ / Q ² /	72	35 34	64.8 66.9	19.7 19.0	7.4 9.2	1952 1954	D. D.	170 330	86 ¹ 110 ¹	F.	31, 198 17, 000	204.8	1/.30	l
/ September	r through De	cember	r only.	2/Stecl		SI	3 Semi	balloor	, B B	lloon, F.	- Flat, D	Diesel, G.	- Gas.	

A rule-of-thumb method of fuel efficiency appraisal for a vessel operator is derived by dividing his annual catch by his annual fuel purchases. The table shows the results for vessels shrimping in the areas mentioned by various tonnages, dimensions, engine power, and by type and size of net. By selecting a vessel with about the same characteristics, an operator can estimate approximately his vessel's fuel consumption rate in relation to others in the shrimping industry. Such a comparison must, of course, take into consideration equal distances to fishing grounds.

The fuel consumption study is one phase of the vessel efficiency study made by a contractor under the supervision of the U. S. Fish and Wildlife Service. The data are a part of a study to investigate important features of vessel design and construction, vessel productivity, and efficiency of navigational and fishing aids. The study was financed by funds made available by the Saltonstall-Kennedy Act of 1954 to help the domestic fishing industry.

South Atlantic Exploratory Fishery Program

EXPLORATORY SHRIMP CRUISES IN SOUTH ATLANTIC, MARCH 1956: Pelican (Cruise 1): The deep-water trawling phase of the Service's South Atlantic exploratory fishery program was initiated by the Pelican, a vessel chartered by the U.S. Fish and Wildlife Service, In a series of 15 deep-water trawling stations off



Shrimp Trawling Stations, M/V George M. Bowers (Cruise 2) and the M/V Pelican (Cruise 1) during March 1956.

Ft. Pierce and Cape Canaveral, Fla., using a 40-foot flat shrimp trawls and a 10-foot beam trawl, large deep-water red shrimp (Hymenopenaeus robustus) were caught in all drags between 180 and 235 fathoms. Catches of shrimp ran from 5 to 20 pounds per 2-hour drag, A 4½-hour drag off Cape Canaveral using an 80-foot balloon trawl caught 125 pounds of red shrimp of mixed sizes, averaging 26-30 count heads off. Numerous problems were encountered in trying to trawl in the strong Gulf Stream current. Attempts to tow against or across the current were unsuccessful. Excellent trawling bottom was found between Ft. Pierce and Cape Canaveral, but on a drag southeast of Ft. Pierce the trawl hung up on a rock "ledge" and the vessel almost capsized before the trawling warp parted.

A series of 5 drags were made in depths of 21 to 80 fathoms between Lake Worth and Cape Canaveral. One pound of 10-count mixed brown shrimp (Penaeus aztecus) and pink shrimp (P. duorarum) were caught in one-hour day and night drags in 21 fathoms southeast of Cape Canaveral.

George M. Bowers (Cruise 2): Exploration of the continental shelf area was continued during cruise 2 of the Service's George M. Bowers (March 6 to 25). Work during this period extended from St. Augustine to Wilmington, N.C. A total of 37 one-hour drags using a 40-foot flat trawl were made in depths of 14 to 45 fathoms.

Commercial shrimp species were caught in only two of these drags. Three individual brown shrimp were caught in 22 fathoms off Savannah, and $3\frac{1}{2}$ pounds of 10-count brown shrimp were caught in a one-hour drag in 40 fathoms off St. Augustine. Two 80-foot balloon trawl drags in this area were unsuccessful in reaching the bottom and fishing operations were discontinued due to bad weather.

Small quantities of rock shrimp (Sicyonia brevirostris) were caught in 17 of the 18 night drags and in 6 of the 15-day drags. Best catches ran about 15 pounds per hour.

Two species of commercially-valuable flounders were caught in most of the drags. Paralichthys dentatus (summer flounders), averaging $\frac{1}{4}$ of a pound, and P. albigutta (sand flounder), averaging about 1 pound, were caught at rates of 2 to 80 pounds per hour. In general, nonutilized fish catches at all stations were small with the exception of one drag at 31 42.5 N. lat., 79 37 W. long., in 36 fathoms, that caught 1,365 pounds of spot (Leiostomus xanthurus). These fish averaged about 3 or 4 to the pound.



South Carolina

SEED OYSTER EXPORT LAW PASSED: During March 1956 the South Carolina Legislature passed a law which makes it legal to cultivate seed oysters in South Carolina for export. The law, as set up, encourages the use of polluted grounds for seed purposes since the seed would be moved when very small. They would then have ample time to cleanse themselves before reaching marketable size. The new act specifies that oysters to be exported as seed may not be over $1\frac{1}{2}$ inches. The tax to ship seed oysters out of state has been established at 2 cents a bushel. There are several other provisions which will be of particular interest to possible seed growers in South Carolina. Commercial oystermen must continue to planthe same amount of cultch for market production as they have in the past. Only shells over and above that amount can be used for export.

The new law was to become effective upon the signature of the Governor of South Carolina. The Governor was expected to act on the legislation promptly. If so, it may be possible that some seed for export may be produced in the State during the summer season of 1956. Experimental shipments of seed oysters to various laboratories along the East Coast have already been made and the results of these plantings may determine if South Carolina seed will have a chance for growth and survival in out-of-state waters.



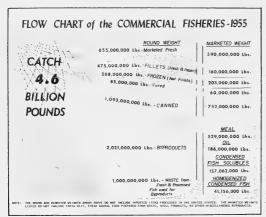
United States and Alaska

ECONOMIC DATA ON COMMERCIAL FISHERIES, 1955: It would take the income from a capital investment of \$10.5 billion dollars at 4 percent annual interest to maintain earnings equivalent to those obtained in the United States and Alaska commercial fisheries during 1955. This information is one part of a preliminary analysis of the 1955 fisheries made by the U.S. Fish and Wildlife Service.

Earnings, which in this instance include profit on the investment and the wages or commissions paid those who handle the fish in the various States, are estimated statistically as follows: At the boat side, 75 percent of the value of the catch at that point; at the processor level, 10 percent of the value at that stage; wholesale, 5.5 percent; retail, 8 percent.

The catch for 1955 was 4.6 billion pounds and the ex-vessel value was \$325,000,000. At the processor level the 1955 catch was worth \$548,000,000; at the wholesale level, \$775,000,000; and at the retail level, \$1,010,000,000. In all instances these are slightly below 1954 when the ex-vessel value of the catch was \$360,000,000.

There were 555,000 workers employed as the result of the activities of the fishing industry. Of these 153,000 were fishermen, 4,000 transporters, and 98,000



en, 4,000 transporters, and 98,000 shore workers (which include those engaged in canning and other processing). There were 300,000 employed indirectly in such industries as gear manufacture, boat building, and manufacturing processing equipment. This is slightly less than the 568,394 employed in 1950 but considerably higher than the 428,965 in 1945.

American fishermen and businessmen had an investment with a replacement value of \$958,000,000 in the commercial fish business in 1955. This figure is an estimated replacement value based upon 1955 data which shows that boats and gear in the commercial fisheries represented an original investment of \$428,204,000; freezing and processing plants, \$215,649,000; whole-

sale facilities, \$193, 475, 000; and fish units in retail establishments, \$92, 257, 000.

There were 87,000 craft of all types engaged in the year's fishing. These included 11,000 vessels of five tons net and over; 48,000 motorboats, and 26,000 other boats, all engaged in fishing. In addition there were 2,000 boats usedfor transportation of fish and shellfish between the fishing grounds and the docks.

The Pacific Coast States had the highest number of processing plants, 148. Of these Washington led with 76, California second with 52, and Oregon next with 20. The South Atlantic and Gulf States were next with 131 plants, Louisiana having 53 and Mississippi 23. The New England States had 84, of which 63 were in Maine; the Middle Atlantic States had 46 with 20 in New Jersey and 16 in New York. There were 20 processing plants in the Mississippi Valley and Great Lakes regions, of which 11 were in Iowa. Alaska was far in front among areas outside the continental United States with 109; Puerto Rico and American Samoa had one each; and Hawaii 2. There were 400 plants in which fish were canned and 227 in which byproducts were processed. The total number of plants, with duplications excluded, was 579.

The monthly catch in 1955 hit its peak in July when 887, 800,000 pounds of fish were taken. The April catch was 170 million pounds, and the December catch 271,400,000 pounds.

In value at ex-vessel the shrimp industry was at the top, a posiiton it has held for several years. The 1955 value for shrimp was \$70,000,000. Tuna and salmon follow in that order.

The 1955 supply of canned sardines was considerably below that of 1954. Heavy reductions in the supply of canned salmon and more moderate reductions in canned tuna stocks were noted. There was a decrease also in the supply of groundfish fillets (including ocean perch). Slight increases were noted in the supplies of shrimp, canned crab meat, and northern lobsters.

San Pedro, Calif., retained its leadership of individual ports in pounds of fish landed (365 million) followed by Reedville, Va., with 305 million; Lewes, Del., with 274 million; and Gloucester, Mass., with 265 million pounds.

The breakdown of manufactured products for 1955 was not available at the time of the analysis, but the 1953 figures show that the \$585,995,000 value at the processor level was divided as follows: canned products, \$306,874,000; packaged shellfish, \$115,994,000; byproducts, \$74,372,000; packaged fish, \$52,163,000; cured fish, \$36,592,000. Since the estimated value of the 1955 catch at the processor level is \$548,000,000, the value of the various categories will probably be correspondingly less.

Fresh-water fishing in 1953 employed the most number of fisherman, 24,000; salmon was next with 21,000; then clamming with about 16,000; and shrimping fourth with 15,000. There were 14,000 engaged in taking oysters; other fisheries employed less than 9,000 each with the Maine herring fishery fifteenth on the list with only 1,050 workers.

Latest data on an area basis is for 1954 when the total American catch was 4,645,000,000 pounds, 45,000,000 pounds higher than the estimated catch for 1955. The data show the Atlantic and Gulf area most productive with 3,301,405,000 pounds, followed by the Pacific Coast States with 825,966,000, Alaska with 337,629,000 pounds, and the Great Lakes and Mississippi Riverfisheries with 180,000,000 pounds.

Imports of edible fishery products for 1954 totaled 803, 369,000 pounds, compared with 725,195,000 in 1953 and 404,768,000 in 1945.

U.S. Canned Fish Production, 1955

California led the Nation in 1955 in the production of canned fish and in the manufacture of fishery byproducts, according to figures released April 5, 1956,

by the U. S. Fish and Wildlife Service. The total value of these commodities was \$147.4 million, nearly 40 percent of the national total of \$386 million (value to the manufacturers).

Alaska was second with canned fish and byproducts valued at \$60 million. Washington was third with like commodities valued at \$26.5 million, with Oregon, Maine, and Louisiana grouped with outputs approximating \$21 million.

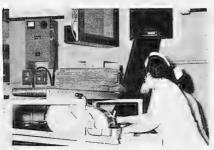


Nationwide there were 533 establishments engaged in canning fish and in the preparation of byproducts.

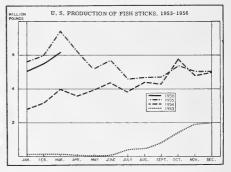
The value of the canned commodities was approximately \$303.6 million and that of the byproducts about \$82.5 million. The value of canned tuna and tunalike fish was \$125 million; salmon \$81 million; Pacific sardines \$10 million; and Maine sardines \$9 million. The value of canned shellfish was set at approximately \$38.5 million.

U.S. Fish Stick Production

JANUARY-MARCH 1956 PRODUCTION BELOW LAST YEAR: The United States production of fish sticks during the first three months of 1956 amounted to 16.6 million pounds, according to Fish Stick Report, January-March 1956 (C. F. S. No. 1307) recently released by the U. S. Fish and Wildlife Service. This was 2.3 million pounds less than the quantity produced during the same period of 1955 but 1.2 million pounds more than the reported production for the last quarter of 1955.



Packing frozen packaged fish sticks into cartons as they come from the freezer on the conveyor system in a Boston plant,



A total of 5.0 million pounds of fish sticks was packed during January, 5.5 million pounds during February, and 6.1 million pounds during March. The largest quantity of fish sticks produced in a single month occurred during March 1955 when 7.4 million pounds were packed.

Table 1 - U. S. Produ		ish Sticks,		Table 2 - U. S. Fish Stick Prod	uction by	Areas, Ja	nMar	. 1955-56			
January-Ma	January-March 1956					January-March					
Month	Cooked	Uncooked	Total	Area	19		-19				
	(Mil	lion Pounds			Firms	Quantity	Firms	Quantity			
January	4.4	0,6	5.0		No.	1,000 lbs.		1,000 lbs.			
February	4.8	0.6		Atlantic Coast States	27	13,060	33	15,591			
March	5,5	0.7		Interior and Gulf States	7	2,283	11	1,918			
Total 1st. Quarter 1956	14.7	1.9	16.6	Pacific Coast States	_ 10	1,259	15	1,440			
Total 1st. Quarter 1955	16.5	2,5	18.9	Total	44	16,602	59	18,949			

During the first quarter of 1956, 88 percent of the total production was precooked. Uncooked sticks accounted for the remaining 12 percent.



U. S. Foreign Trade

GROUNDFISH FILLET IMPORTS DROP 19 PERCENT IN MARCH 1956: United States imports of groundfish (including ocean perch) fillets during March 1956 totaled 11.7 million pounds, compared with 14.5 million pounds in March of last year. This was a decrease of 19 percent. The major cause for the decline was a 2.0-million-pound drop in imports of groundfish fillets from Canada. Smaller decreases were also noted for Iceland, Denmark, the United Kingdom, and Netherlands. Imports of groundfish fillets from Norway and West Germany were somewhat higher during March of this year than during the same month in 1955.

Canada again led all other countries exporting groundfish fillets to the United States with 6.4 million pounds in March 1956--54 percent of the total groundfish fillet imports during the month. Iceland was in second place with 4.3 million pounds.

Total groundfish fillet imports into the United States during the first quarter of 1956 amounted to 38.2 million pounds. This was 6 percent more than the quantity imported during the corresponding period of 1955. Canada, with 25.6 million pounds, led all other countries exporting fillets to this country during the above period, followed by Iceland (9.4 million pounds) and Norway (1.5 million pounds).

* * * * *

EDIBLE FISHERY PRODUCTS, JAN-UARY 1956: United States imports of edible fresh, frozen, and processed fish and shellfish for January increased about 28.9 percent in quantity as compared with December 1955, and were also 32.5 percent higher than the imports for January 1955. The value of the imported fishery products in January 1956 increased by 15.1 percent as compared with December 1955 and were higher by 39.4 percent than January 1955. The dollar value in January 1956 was close to 27.2 cents a pound, compared with 25.9 cents a pound in January 1955. Shrimp and fillet imports both increased

	l Q	uantit	у		Value		
Item		an.	Year	Ja		Year	
			1955				
	(Mill	ions o	Lbs.)	(Mil	ions	of \$)	
Imports: Fish & shellfish: fresh, frozen, & processed1/	72.7	54.9	768.3	19.8	14.2	206.4	
Exports: Fish & shellfish: processedI/ only (excluding fresh and frozen) 10.9 12.2 91.0 2.1 2.3 21.6							

in January 1956 when compared with January 1955.

Exports of processed fish and shellfish for January 1956 decreased about 11 percent from the December 1955 total, and were 10 percent less than in January 1955. Stocks of exportable canned fishery products other than tunas were low in January 1956.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-FEBRUARY 1956: Notable among the trends shown in United States imports of fish-



ery products during the first two months of 1956 were substantial increases in imports of groundfish fillets, frozen tuna, shrimp, canned salmon, fish meal, and fillets of flounder, wolffish, and fresh-water fish.

Compared to the first two months in 1955, imports for the first two months of this year of groundfish fillets and blocks increased 21 percent; blocks or slabs, however, were 26 percent less, while the plain fillets were 52 percent greater. Shrimp imports were 154 percent larger than those of the first two months of 1955. All frozen tuna imports increased 8 percent, but imports of albacore tuna

were 28 percent less and other frozen tuna imports 55 percent greater than those of the same period a year ago. Imports of canned tuna this year were down 11 percent. Canned salmon imports in the first two months of 1956 were much greater than those of a year ago--5.3 million pounds, largely from Japan. Imports of fish meal were 16 percent larger than a year ago.

United States exports of canned sardines during the first two months of 1956 were 13 percent greater. Fish oil exports gained 13 percent.

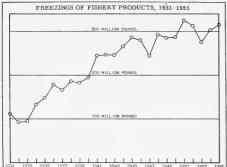
* * * * *

SHRIMP IMPORTS FROM MEXICO INTO ARIZONA-CALIFORNIA, 1955/56 SEASON THROUGH MARCH 17: The catch of shrimp in the Gulf of California appears to have set a record, according to the Service's Fishery Marketing Specialist at San Pedro, Calif. The imports of shrimp this season to March 17, 1956, from Mexico and entering the United States through Arizona and California totaled 28.6 million pounds as compared with 12.4 million pounds in the similar period of 1954/55. The 1955/56 Mexican west coast shrimp fishing season has been one of the most successful due to excellent production and a high price level because of poor catches in the Gulf of Mexico.



United States Freezings of Fish and Shellfish, 1955

Freezings of fish and shellfish in the United States and Alaska in 1955 amounted to 314.7 million pounds, according to <u>Frozen Fish</u>, <u>1955</u> (C.F.S. No. 1276) recently issued by the U.S. Fish and Wildlife Service. This was an increase of 12 million pounds, or 4 percent, over 1954 freezings. A catch of approximately 505



million pounds of fish and shellfish was required to produce the 314.7 million pounds of round, dressed, and drawn fish, fillets, steaks, and packaged shellfish frozen during 1955 by 287 firms throughout the United States and Alaska.

Of the year's total freezings, 69 percent were handled during the 6 months beginning with May and ending with October. Freezings during this period averaged nearly 36 million pounds a month, compared with an average of 16 million pounds a month during the other six months of the year.

led all others during the year, followed by ocean perch fillets (39 million pounds), whiting (36 million pounds), fish sticks (32 million pounds), and halibut (27 million pounds). These 5 items accounted for 58 percent of the total freezings.

Of the total 1955 freezings of fishery products, 169 million pounds (54 percent) was handled in the New England Area, followed by the South Central Area (46 million pounds), the Pacific Area (33 million pounds), and Alaska (32 million pounds). These four areas froze 89 percent of the yearly total.



Washington

BRINE SHRIMP USED TO FEED PINK SALMON FINGERLINGS: The Washington State Department of Fisheries is feeding Utah brine shrimp to pink salmon fry at its Hood Canal hatchery and the fish are thriving on them. The tiny salt-water shrimp are so tiny that it takes 26 million of them to fill a measuring cup.

Feeding the shrimp to the pink salmon fingerlings is part of an experiment which may ultimately aid in transplanting an even-year pink salmon run into Washington waters. (Pink salmon with a two-year life cycle normally run in Washington streams only on odd-numbered years.)

The salmon grow more uniformly with a brine shrimp diet than with the usual diet of fish viscera, and the shrimp diet virtually eliminates "pinheads" (fish that do not feed) and the subsequent mortalities from pinheads, report fisheries research workers.

Brine shrimp of the genus <u>Artemia</u> are a popular aquarium diet but have not been utilized previously in this state for the hatchery-produced salmon. The shrimp are commonly found in salty and alkaline lakes and artificial salt ponds throughout the world. The eggs are extremely hardy and will survive in a dried condition for years without harm to the germ cell. Upon introduction into water of proper salinity and temperature, they will hatch within about 48 hours and reach sexual maturity in about three weeks.

The dormant shrimp eggs are imported from Great Salt Lake, Utah, where they are harvested on the shore and dried. When placed in aerated jugs of heated sea water the tiny shrimp hatch out, increasing six times in volume and become live animacules that not only are relished by the pink salmon fry but are easier for the fish to eat. The shrimp go a long way as food, too; a quart of dry eggs will feed 500,000 pink salmon fry for a day.

The attempt by the Washington Fisheries Department to create an even-year run of pink salmon has met with varying results. A batch of 900,000 eggs from Alaska and Canada, hatched at the Samish hatchery in 1948 and transferred to the Deception Pass marine research station for salt-water rearing, brought gratifying results in 1950 when between 300 and 500 surviving adult pinks returned.

With these initially-encouraging results additional rearing of young pinks in salt water was undertaken, but new problems arose. The most spectacular was a heavy mortality due to pinheads. In effect, some of the fry eat well, while others eat little or not at all. Total mortality on regular hatchery diets in the pastranged from 40 to 60 percent, with a bulk of the mortalities caused by pinheads.

Rearing pink salmon to a size where they are competitive when they enter the open salt-water areas is a ticklish business and requires a closely supervised diet. The pinks feed primarily on plankton in the ocean.

Experiments in the feeding of brine shrimp will continue, but results so far add a happy note to the possibilities of creating a good, healthy liberation of reared even-year pink salmon in Washington waters.

* * * * *

EXPERIMENTS TO AID DOWNSTREAM SALMON MIGRATIONS AT MERWIN DAM: Juvenile salmon who landlock themselves behind power dams and never go to sea are as useless in maintaining their race as those who plunge to their death over spillways, according to a February 29 news release of the Washington State Department of Fisheries.

During the spring of 1956 the Washington Department of Fisheries, in cooperation with Pacific Power & Light Co., will attempt to solve the problems that make Merwin Dam on the Lewis River as much an obstacle to the downstream migrants on their way to sea as their parents found on their upstream spawning migration.

Rehabilitation of several depleted salmon runs on major rivers is awaiting the outcome of this and associated studies.

The double barrier formed by Lake Merwin is typical at high dams which spill little or no incoming water during much of the spring and summer migration period. Silver salmon especially tend to landlock themselves on the Lewis River, and each spring yearlings by the tens of thousands never leave the upper watershed.

Experiments in 1952-55 at dams on the Elwha, Baker, and White rivers on Puget Sound proved that salmon were reluctant to use the turbine intake as an impoundment exit route if the latter were at substantial depths, particularly if surface water was being spilled. Moreover, even if the spillways and turbines were accessible, in most cases their mortality tolls made them equally undesirable.

The Merwin Dam tests will utilize a variety of flow volumes and intake depths over the next three months to find how much water it takes to attract impounded migrants into a collection system at the face of the dam, where they can be counted and led downstream. The different attraction depths will be tried because salmon have been found to disperse themselves over a wider vertical range behind a dam when it is not spilling water. When it is spilling, the young fish tend to move with the surface layer.

The end result, not only at Merwin Dam, but at others throughout the Pacific Northwest, should be a workable method of passing migrants around such structures with minimum mortalities and delay. Since conservation of power-producing water is important to the hydro-electric companies, another objective will be to determine the least flow that will do the job effectively.

Pacific Power & Light Co., which already contributes most of the operating funds for a salmon hatchery downstream from Merwin Dam and a smaller unit above its Yale Dam, will provide up to \$24,000 for the project. This will be matched by the Department of Fisheries out of special funds provided by the 1955 Legislature for salmon rehabilitation research in the field of water storage and downstream migration problems.

* * * * *

EXPERIMENTS ON SALMON MORTALITIES AT McNARY DAM CONTINUED: A flotilla of 15 pontoon fishing platforms is being assembled by the Washington State Department of Fisheries on the Columbia River in a renewed phase of region-wide investigations into means of reducing salmon mortalities caused by power dams.

The pontoon nets will be dispersed over 35 miles of river below McNary Dam as part of a major fisheries research program being financed by the United States Army Corps of Engineers. Its principal objective will be to determine how the dam affects the survival of young salmon bound from the Snake and upper Columbia River watersheds for the ocean. From it, and associated studies assigned to other fishery agencies, are expected to come solutions for the critical problem of safeguarding the salmon runs of the Pacific Coast and Alaska in areas where hydroelectric power is dominant or proposed.

During the winter the pontoon fishing equipment has been under repair or construction at the Fisheries Department's Yakima shop. Beginning in March, crews of biologists and others will begin the task of releasing more than 700,000 marked chinook fingerlings at McNary Dam. Some will be liberated into the spillways, others in the turbine intake system, and some into the river immediately below the dam tailrace. The recovery nets will be spaced from a point downstream from the dam to Arlington, Ore.

An unusual phase of the study will be the use of tattooing machines to mark the young chinooks. The equipment, developed by Department researchers in 1953-54, injects various colored pigments under the skin as a substitute for the usual finclipped mark used to trace the migration of hatchery salmon.

* * * * *

IMPORTS OF SALMON REGULATED: In a notice to the fishing industry dated March 15, 1956, the Washington State Department of Fisheries issued the following regulation in regard to establishing certain procedures under which salmon imported from Alaska and Canada may lawfully proceed through the State of Washington in transit to out-of-state points during the closed season within the State.

"It shall be lawful for a common or contract carrier to transport, during seasons in which the taking, catching, or possession of chinook or silver salmon is unlawful in the State of Washington or in waters over which the State of Washington has jurisdiction, an original package or packages containing either silver or chinook salmon, which original package or packages both originate from and are destined for some other state, territory or foreign country provided, that for the purpose of this regulation, the term "original package" shall mean a package from which fish cannot be extracted without an opening or breaking thereof and which is accompanied by documentary proof that the original point of shipment and the point of destination is another state, territory or foreign country; provided further, that it shall be unlawful for any such carrier to open or break any such original package while the same is in his possession, except for the purpose of re-icing; provided further, that the waters of the Pacific Ocean shall not be considered a state, territory or foreign country."

* * * * *

REBUILDING SALMON RUNS TO THE YAKIMA RIVER AND TRIBUTARIES PLANNED: The salmon population in the Yakima River and its tributaries may again approach those of the past if a comprehensive long-range rehabilitation plan prepared by the Washington State Department of Fisheries for the United States



Bureau of Reclamation is carried out. Completion of the plan would add nearly 2.5 million dollars a year to the value of the salmon take from the river, states a March 12 news release of the Washington State Department of Fisheries.

Three basic requirements are necessary for the over-all rehabilitation of the Yakima River system to aid in the development of its potential fish resource, ac-

cording to a comprehensive evaluation report prepared by the State Department of Fisheries in cooperation with the State Department of Game. They are:

- 1. Safe and efficient passage of adult fish upstream to their spawning grounds and of juveniles to the ocean. This will require both additional fishways and guaranteed minimum flows. The latter will depend largely on additional upriver storage.
- 2. Adequate conditions of water depth, velocity, and temperature, and maximum development of potential spawning areas.
- 3. Suitable rearing water for the young salmon until they are mature enough for departure to the ocean. A corollary is continued improvement and operation of the fish-screen system.

If these requirements are met, the report states, there is good chance to restore fish production to somewhere near its former level.

At present, annual production averages 860,000 pounds as compared to a catch (before 1900) of 7 million pounds. Potential production, assuming the introduction of sockeye salmon, which are not present at all now, is estimated at more than 4.5 million pounds. One of the steps toward realization of the program is the recently-completed vertical-baffle design fishway at the Prosser diversion dam on the Yakima. In the past, chinook salmon bound for spawning grounds in the upper Yakima and Naches rivers have had to use all of their famous endurance and "instinct" to ascend the Prosser Dam. Some years, when the water was low, the barrier was more of a delay than Bonneville Dam.

The new fishway, 150 feet long and 8 feet wide, is the first of its type on the Yakima. It is on the right bank of the river, adjacent to the intake foundation of an old power dam. Removal of the old pool-type fish ladder in the center of the dam also is scheduled, and a fishway similar to the one just completed will be installed about 150 feet from the left bank.

The new fishway has 14 automatically-regulated pools, each pool one foot higher than the preceding one, and is equipped with an auxiliary water supply system arranged to aid the rapid passage of fish upstream to spawn.

The increase in the capacity of Chandler canal, which made the new fishways even more necessary, also required the installation of two additional fish screen sections in the canal. The two new screens and eight formerly used have been converted to electrical drive, replacing the familiar paddle-wheel propulsion. The screens, each 10 feet wide and 11-12 feet in diameter, divert downstream migrants from the canal back to the river. The system is exceeded in size only by those at Sunnyside and Roza dams.

Total cost of the Prosser fish facilities to the Bureau of Reclamation will exceed \$300,000. The Washington Department of Fisheries has contributed \$15,000 to the construction cost and has shared the functional design work with the United States Fish and Wildlife Service.



Wholesale Prices, April 1956

In April 1956 the over-all wholesale index for all edible fish and shellfish (fresh, frozen, and canned) dropped 4 percent below that for March 1956 (108.6 percent as compared with 113.1 percent of the 1947-49 average), but climbed 10 percent above that for April 1955. Changes in the indexes for individual items were sharp, in some cases due to seasonal changes in supply and market conditions.

The index for the drawn, dressed, or whole finfish subgroup declined 12.3 percent from March to April 1956 because of lower prices for all items in this sub-

group except frozen halibut (up 8.4 percent). During that period haddock prices at Boston dropped 36, 2 percent and fresh yellow pike prices at New York City were down 60 percent. Changes downward are to be expected at this period of the year due to seasonally-better supplies of fresh haddock and fresh-water fish from the Great Lakes. Because halibut stocks are at a record low level and because the new fishing season in the North Pacific does not begin until mid-May, prices for this product went up. Compared with April 1955, this subgroup index in April 1956 was higher by 12.8 percent.

The fresh processed fish and shellfish subgroup index in April 1956 was about unchanged from March 1956, but was 16.9 percent higher than in the same month a year ago. Fresh haddock fillet prices at Boston declined 20 percent from March to April 1956, and were 7.3 per- Boxing and icing fish for the wholecent lower than in April 1955. To offset this, fresh



sale market.

Table 1 - Wholesale Average Prices and Ind	exes for Edibl	e Fisl	and S	h ell fish, A	pril 1956	6 With C	ompari	sons
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. I	Prices1/		Inde (1947=4		
			Apr. 1956	Mar. 1956	Apr. 1956	Mar. 1956	Feb. 1956	Apr. 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.6	113,1	113.7	98.7
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz.	Boston New York	lb. lb.	.05 .34	.32	115.2 100.5 50.1 106.2	120,6 114,6 78,5 98,0	121,7 114,1 86,9 97,5	98.1 89.1 64.2 68.1
Salmon, king, lge, & med., drsd., fresh or froz. Whitefish, L., Superior, drawn, fresh Whitefish, L., Erie pound or gill net, rnd., fresh Lake trour, domestic, No. 1, drawn, fresh Yellow pike, L., Michigan & Huron, rnd., fresh	New York Chicago New York Chicago New York	lb. lb. lb. lb.	.61 .69 .60 .54	.61 .82 .80 .82 .52	137.1 171.0 121.3 110.6 49.3	137.6 204.5 161.8 168.0 123.1	134,3 181.0 131.4 150.6 129.0	112.4 179.7 151.6 141.4 64.5
Shrimp, Ige. (26-30 count), headless, fresh :	Boston New York Norfolk	lb. lb. gal.	24 79 5.62	.30 .77 5.62	126,6 81,7 124,8 139,2	126,5 102,1 120,9 139,2	127.6 110.6 121.7 139.2	105,2 88.5 101,1 114,4
Processed, Frozen (Fish & Shellfish):					114.3	112,3	116.5	95,3
Fillets: Flounder, skinless, 1-lb, pkg. Pkg. Haddock, sml, skins on, 1-lb, pkg. Ocean perch, skins on, 1-lb, pkg. Shrimp, Ige, (26-30 count), 5-lb, pkg.	Boston Boston Gloucester Chicago	lb. lb. lb. lb.	.40 .29 .29 .76	.39 .29 .29 .73	103.4 91.0 114.8 116.5	102.1 91.0 114.8 113.0	102.1 92.6 114.8 119.6	110.0 86.3 111.8 84.1
Canned Fishery Products: Salmon, pink, No.1 tall (16 oz.), 48 cans/cs	Seattle	case	21,27	21.27	99.2 120.0	102,4 120,0	102.4 120.0	99.4 109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/ cs Sardines, Calif., tom. pack, No. 1 oval (15 oz.),	Los Angeles				77.1	85,1	85.1	91.6
48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	Los Angeles New York	case	7.38 8.45	7,12 8,45	86.1 89.9	83 . 2 89 . 9	83,2 89,9	85 _• 2 76 _• 6

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

shrimp prices increased about 3.2 percent between March and April 1956 and were 24 percent higher than in April 1955.

The April 1956 index for the frozen processed fish and shellfish subgroup was up slightly (1.8 percent) when compared with the previous month and also higher by 20 percent compared with April 1955. The rise between March and April 1956 and from April 1955 was due mainly to higher frozen shrimp prices. Frozen shrimp prices in April 1956 at Chicago were 38.5 percent higher than in April 1955.

The canned fishery products subgroup index in April 1956 experienced its first decline in several months almost entirely due to a drastic cut in canned tuna prices because of liberal stocks of the light-meat grade. The index for this subgroup from April 1955 to April 1956 was about unchanged. However, April 1956 prices for canned pink salmon and Maine sardines, because of a very light supply, were substantially higher than in April 1955. On the other hand, April 1956 prices for canned tuna were significantly lower than in the same month a year ago.

CORRECTION: In the April 1956 issue of Commercial Fisheries Review, page 27, in "Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1956 with Comparisons," the second column under the heading "Avg. Prices" should have been headed "Jan. 1956" and the second column under the heading "Indexes (1947-49-100)" should have been headed "Jan. 1956."

The same table in the May 1956 issue also had the same type of errorthe second column under the heading "Avg. Prices" should have been headed "Feb. 1956" and the second and third columns under the heading "Indexes (1947-49-100)" should have been headed "Feb. 1956" and "Jan. 1956," respectively.



DANISH EXPERIMENTS ON ELECTROLYTIC TIN-PLATE CANS

Experiments carried out at the Danish Ministry of Fisheries Research Laboratory, Copenhagen, Denmark, on electrolytic tin plate cans have shown that none of the Danish fish packed in the unlacquered cans had good keeping quality. The tin plate tested contained 0.25, 0.50, and 0.75 pound of tin per base box (5.6, 8.4, and 16.8 gm. of tin per $\rm m^2$ of the surface). Sardine and mackerel in oil can be packed in lacquered cans, but fish intomato sauce and other corrosive products cannot be packed in cans lacquered with lacquers available in Denmark.

--Konserves, Nov. 1953.



International

INTER-AMERICAN SPECIALIZED CONFERENCE ON CONSERVATION OF NATURAL RESOURCES

RESULTS OF MEETING ON CONTINENTAL SHELF AND MARINE WATERS: The Inter-American Specialized Conference on "Conservation of Natural Resources: The Continental Shelf and Marine Waters" was adjourned March 28 after it had approved a resolution. The Conference opened in Ciudad Trujillo, Dominican Republic, on March 15.

- "I The Inter-American Specialized Conference on Conservation of Natural Resources: Continental Shelf and Marine Waters considering: That the council of the organization of American States in fulfillment of resolution LXXXIV of the Tenth Inter-American Conference held in Caracas in March 1954, convoked this Inter-American specialized conference 'for the purpose of studying as a whole the different aspects of the juridical and economic system governing the submarine shelf, oceanic waters, and their natural resources in the light of present-day scientific knowledge;' and that the conference has carried out the comprehensive study that was assigned to it; resolves: To submit to the consideration of the American states the following conclusions:
 - "1. The seabed and subsoil of the continental shelf, continental and insular terrace or other submarine areas adjacent to the coastal state outside the area of the territorial sea and to a depth of 200 meters, or beyond that limit to where the depth of the superjacent waters admits of the exploitation of the natural resources of the seabed and subsoil, appertain exclusively to that state and are subject to its jurisdiction and control.
 - "2. Agreement does not exist among the states here represented with respect to the juridical regime of the waters which cover said submarine areas nor with respect to the problem of whether certain living resources belong to the seabed or to the superjacent waters.
 - "3. Cooperation among states is of the utmost desirability to achieve the maximum sus-

- tainable yield of the living resources of the high seas bearing in mind the continued productivity of all species.
- "4. Cooperation in the conservation of the living resources of the high seas may be achieved most effectively through agreements among the states directly interested in such resources.
- "5. In any event, the coastal state has a special interest in the continued productivity of the living resources of the high seas adjacent to its territorial sea.
- "6. Agreement does not exist among the states represented at this Conference either with respect to the nature and scope of the special interest of the coastal state or as to how the economic and social factors which such state or other interested states may invoke should be taken into account in evaluating the purposes of conservation programs.
- "7. There exists a diversity of positions among the states represented at this conference with respect to the breadth of the territorial sea.
- "II Therefore, this conference does not express an opinion concerning the positions of the various participating states on the matters on which agreement has not been reached and: Recommends: That the American States continue diligently with the consideration of the matters referred to in paragraphs 2, 6, and 7 of this Resolution with a few to reaching adequate solutions."
- At the conclusion of the Conference and in view of certain statements made by the delegations of other countries at the final plenary session on March 27, the United States delegation issued the following statement:
 - "(A) The government of the United States does not recognize a right on the part of a coastal state as claimed by certain delegations to exclusive

control over the resources of the high seas. The United States maintains that in accordance with international law fishery regulations adopted by one state cannot be imposed on nationals of other states on the high seas except by agreement of the governments concerned. Moreover, the United States delegation also wishes to record the fact that it made a specific proposal for the conference which would, if adopted, effectively meet the conservation problem that would be posed in the event of failure of the interested states including the coastal state to reach agreement on the need for and application of conservation measures.

"(B) The government of the United States does not recognize that a state has competence to determine the breadth of its territorial sea apart from international law.

"(C) The delegation of the United States also wishes to call attention to the fact that broader consideration having been given at this conference than at any previous Inter-American meeting to the various aspects of the subject on its agenda, the present resolution of Ciudad Trujillo constitutes the latest and most authoritative expression of the Organization of American States on the subjects discussed therein.

Note: Also see Commercial Fisheries Review, May 1956, p. 37.

INTERNATIONAL LAW COMMISSION

CONVENES AT GENEVA FOR EIGHTH SESSION: The grouping together systematically in a single report of all the rules adopted by it in respect of the high seas, the territorial sea, the continental shelf, contiguous zones, fisheries, and the protection of the living resources of the sea, will be among the tasks before the United Nations International Law Commission (ILC) at its eighth session starting April 23 and ending about June 29 in Geneva.

The Commission, whose 15 members are recognized international law experts elected by the General Assembly, has as its objective the promotion of the progressive development of international law and its codification.

Questions pertaining to the "regime of the high seas" and the territorial sea-forming the first two items of an 11-point provisional agenda-have been before the Commission for several years and have been the subject of a number of reports prepared by J.P.A. François of the Netherlands, a member of the Commission and special rapporteur on this subject.

The Commission prepared, at its seventh session, a set of provisional articles concerning the regime of the high seas and a number of draft articles on the regime of the territorial sea which were subsequently circulated to governments for comment. The observations of the 18 governments which have so far replied and a further report by Professor Francois will form the basis for discussion by the Commission in the light of which a final report on the law of the sea is expected to be drawn up for submission to the eleventh session of the General Assembly.

There are a number of other items on the provisional agenda of the Commission not related to the subjects indicated above.

The members of the Commission are: Gilberto Amado (Brazil), Douglas L. Edmonds (United States), Sir Gerald Fitzmaurice (United Kingdom), J.P.A. Francois (Netherlands), F. V. Garcia-Amador (Cuba), Shuhsi Hsu (China), Faris Bey el-Kouri (Syria), S. B. Krylov (U.S.S.R.), L. Padilla Nervo (Mexico), Radhabinod Pal (India), Carlos Salamanca (Bolivia), A.E.F. Sandstrom (Sweden), Georges Scelle (France), Jean Spiropoulos (Greece), Jaroslav Zourek (Czechoslovakia).

GENERAL AGREEMENT ON TARIFFS AND TRADE

AUSTRIAN CANNED FISH IMPORT DUTIES RENEGOTIATED: Changes in Austrian import duties on canned salmon, pilchards, and tuna in brine will result from the negotiations under Article XXVIII of the General Agreement on Tariffs and Trade. Duties on canned tuna in oil will be bound at the old rate. These negotiations were based on the draft of a new Austrian tariff which utilizes the standardized Brussels nomenclature and advalorem rates on most tariff items. The new tariff is expected to be put into effect upon approval of the Austrian Parliament early in 1956.

The new and old tariff rates are as follows:

Old Tariff No.	New Tariff Item 16,04 B. Othe	r prepared on preserved fish;
	1, In	airtight containers:
ex 107	ех а	Tuna-fish, salmon and pilchards, solely in oil; 15 percent ad valorem (old rate 15 percent); Non-GATT rate, 15 percent.
ex 107	ex b	Tuna-fish, salmon and pilchards, cooked or smoked in own juice; 180 schillings per 100 kilogramsequivalent to US\$3,15 per 100 pounds (old rate 15 percent); Non-GATT rate 595 schillings per 100 kilogramsequivalent to US\$10,40 per 100 pounds,

Imports from the United States under the latter item in 1954 were valued about US\$1,000. These items were freed from quantitative restrictions on dollar imports as of July 15, 1955.

In the negotiations, the United States agreed to a modification of tariff concessions previously granted by Austria. Austria was permitted to alter 13 concessions directly granted to the United States in prior negotiations. Three of these were withdrawn and 10 were raised and then bound at the higher level. To compensate for these withdrawals and modifications, Austria reduced rates on 8 items below the levels at which they were previously bound and granted new concessions on 23 items. Sixteen items on which Austria agreed to grant compensatory concessions were freed from quantitative restrictions on dollar imports.

Negotiations to this end followed decisions by Austria to invoke Article XXVIII of the General Agreement on Tariffs and Trade which permits GATT countries, at specified but infrequent periods, to withdraw or modify concessions previously granted. No changes in United States duties were involved in this renegotiation. Note: Also see Commercial Fisheries Review, May 1956, p. 37

FOOD AND AGRICULTURE ORGANIZATION

MEDITERRANEAN FISHERIES COUNCIL TO MEET IN TURKEY: The General Fisheries Council for the Mediterranean Sea will hold its fourth meeting in Istanbul from September 17 to 22, 1956. Invitations have been sent to 14 countries and six international organizations to send representatives.

Eleven member countries on the Council--Egypt, France, Greece, Israel, Italy, Monaco, Spain, Tunisia, Turkey, United Kingdom, and Yugoslavia--are expected to send delegates. Some other non-member countries interested in the Mediterranean fisheries have been invited to send observers, reports the March 9 issue of The Fishing News.

The meeting is expected to lead to more effective cooperation in matters concerning the Mediterranean fisheries, chief aim of the Council.

At the third meeting experts submitted 54 papers, a valuable contribution to the study of Mediterranean fishery problems, and the Council has issued an invitation to send special papers to the Istanbul meeting.

WHALING

1956 ANTARCTIC PELAGIC WHALING RESULTS BELOW 1955 SEASON: Sharp competition between a larger number of expeditions for a smaller quota of whales (15,000 blue-whale units this season as against 15,500 in 1955) made this year's season 15 days shorter than the previous season. This season's Antarctic pelagic



(open sea) baleen whaling season, which ended March 5, resulted in a provisional catch of 14,860 blue-whale units, or somewhat less than the 15,300 blue-whale units in 1955. Seven countries participated in this season's pelagic whaling, which opened on January 7, 1956.

Norway: In spite of the increased efficiency of Norwegian catchers, only 2 of the 9 Norwegian Antarctic expedi-

tions exceeded last year's baleen whaling catch.

Total Norwegian production of 783,568 barrels (133,200 metric tons) of whale and sperm oil for this season was slightly lower than the 1955 production of 806,244 barrels (137,060 tons), states a March dispatch from the United States Embassy in Oslo.

The Norwegian Thorshammer made out better than any of the other Norwegian floating factories, despite the fact that it is one of the oldest and that its boiling plant is relatively inefficient. On top of that, it operated with only 8 catching vessels, while some of the more modern ones had up to 16. According to several old-timers, this proves that Antarctic whaling nowadays is a sheer gamble, and something should be done about it.

For the Norwegian expeditions as a whole, the 1956 Antarctic whaling season marked a new low, yielding only Kr. 137 million (US\$19.2 million) worth of whale oil, as against Kr. 186 million (US\$26.1 million) in 1955 and Kr. 227 million (US\$31.8 million) in 1954. The whale oil production in three seasons was, respectively, 654,848 barrels (111,311 metric tons), 668,352 barrels (113,620 metric tons), and 929,077 barrels (157,943 metric tons). The average for each Norwegian catcher vessel was only 5,953 barrels, as compared with 9,540 barrels for each of the Japanese catcher vessels. Soviet and British catcher vessels were also ahead. To most of the Norwegian whaling specialists, the trend is disturbing, whatever the cause. Altogether about 7,000 Norwegians earn their living as whalers. Of these, some 5,000 are engaged by Norwegian expeditions, and 2,000 work for British companies. In addition, whale and sperm oil provide the raw materials for a growing processing industry, which employs quite a few workers. Above all, whaling is an important source of foreign exchange.

The Norwegian Whaling Association marketing pool states that all of Norway's 1956 season whale and sperm oil has been sold for about 230 million kroner (US\$32.2 million), compared with the value of 212 million kroner (US\$29.7 million) for the 1955 production. Early in the season 19,000 long tons of whale oil were sold for about US\$245 a long ton, and the remainder of the catch was sold for about US\$238 a ton. The average price for the 21,000 tons of this season's sperm oil was between US\$189 and US\$196.

A statement published in the <u>Sandefjords Blad</u> and reproduced in the March 29, 1956, <u>News of Norway</u>, describes the 1956 season as disappointing. "The widely varying results achieved by the individual expedition," the newspaper writes, "clearly indicates that the whale stock is declining." The <u>Sandefjord Blad</u> also states that leaders of the Norwegian whaling industry are hoping for an international agreement to limit the number of catcher vessels employed by the expeditions. This, many believe, would cut costs without reducing the whale catch.

There is general agreement in Norwegian whaling circles that the total quota for the 1957 Antarctic season should be reduced from 15,000 to 14,500 blue-whale units, as a means of preserving the whale stock. At last year's International Whaling Convention, held in Moscow, the Norwegian delegates raised the question of placing neutral observers aboard all factory vessels.

In a recent move, the Norwegian Whaling Association has made strong efforts to restore the international agreement on voluntary limitation of the number of catcher vessels that may be used by each expedition, which was in effect during the 1953/54 and the 1954/55 whaling seasons. Norwegian whaling operators are of the opinion that too many catcher vessels are attached to each expedition, particularly in view of the relatively short season, which this year lasted only 58 days. Sending more catcher vessels than strictly necessary is a losing proposition, they feel.

Whaling requires heavy investments and the cost of operation runs high. Construction of a modern factory vessel costs well over Kr. 40 million (US\$5.6 million), and annual operating expenditures average Kr. 20-25 million (US\$2.8-3.5 million). A new catcher vessel comes to Kr. 6-7 million (US\$840,000), and at least Kr. 1 million (US\$140,000) is needed to pay for each year's operations. It costs an average of Kr. 400,000 (US\$56,000) per day to keep an expedition on the Antarctic hunting grounds.

The total production of oil was 110,000 barrels for the 1956 season, as compared with 99,000 barrels in 1955, and 147,000 barrels for 1954.

Japan: The catch of the three Japanese Antarctic expeditions which participated in the 1956 season was 5,154 baleen whales, or 2,742 blue-whale units, as compared with 4,989 whales, or 2,772 units, in 1955. The 1956 Japanese baleen catch yielded 102,141 metric tons of whale products as compared with 93,126 tons the previous season.

The total catch for the season, including sperm whales, which began at the end of 1955 on an unlimited basis, amounted to 6,462 whales, which yielded 115,321

Tab	le 1	- Japar	nese Ant	arct	ic Wha	le Catch, 19	5 4 /55 ar	id 1955	56 Seaso	ns
	Baleen					Grand	No. of	No. of		
Season	Blue	Fin	Hump- back	Sei	Total	Total Blue- Whale Units	Sperm	Total	Mother-	
			back						ships	Boats
L					(Numb	,			11	
		4, 524		7	5, 154	2,742	1,308	6,462	1 3	40
1954/55	590	4, 220	179		4,989	2,772	967	5,956	3	36
1/ In the 195 12/3/55	5/56 se to 3/4/5	ason, one	of the fleets	opera	ted from	11/24/55 to 3/5/56	; one from I	1/22/55 to	3/5/56; and c	ne from

metric tons of whale products. The previous season's catch amounted to 5,956 whales and a yield of 102,873 tons. Thus there was an increase of 10.8 percent in the baleen and sperm catch and 11.2 percent in yield as compared to the previous season's totals.

Japan produced 57,611 metric tons of baleen oil from this season's catch, of which 51,500 tons, according to present plans, will be exported. So far 35,500 tons

Table 2 - Japanese Production of Whale Products from Antarctic Catch, 1954/55-1955/56 Seasons 1955/56 Season 1954/55 Season Product Baleen | Sperm | Total | Baleen | Sperm | Total (Metric Tons) 57, 611 | 11, 894 | 69, 505 | 53, 555 | 8, 822 | 62, 377 35, 564 180 35, 744 29, 489 5 29,494 Frozen meat Salted meat 791 10,743 8.895 1,073 9,968 9, 952 Liver oil 71 24 95 53 17 70 9 9 77 112 Others 189

of far 35,500 tons have been sold to West Germany at a reported price of £86 per metric ton, compared to a price of £74 for the previous season's production. It is also reported by a reliable source that

3,600 tons of sperm oil have been sold to the United States at a price equivalent to L71 per ton. Japanese exports of fish oils, including whale oil, are expected to reach a high level during the coming year owing not only to larger production of whale oil, but also heavy production of herring oil coupled with a favorable price trend in the European market.

Note: I blue-whale unit equals I blue whale, or 2 fin whales, or 2.5 humpback whales, or 6 sei whales. Thus, the actual number of whales taken during the season is far greater than the indicated number of units.

Also see Commercial Fisheries Review, March 1956, p. 28.

POLISH AND SOVIET FLEETS FISH IN NORTH ATLANTIC

The Soviet Union and Poland are conducting extensive fishing operations in the North Atlantic Ocean and the North Sea, according to an interview published in $\underline{\text{Ex-trabladet}}$, a Copenhagen newspaper, and reproduced in the February 8 $\underline{\text{Fiskaren}}$, a Norwegian fishery trade periodical.

The Soviet Union has a fleet of 350 craft (mostly from Murmansk) with four large motherships. According to the Danish citizen interviewed (who was a Soviet herring inspector in the Farce Islands in 1953), the fleet in 1953 carried 5,000 crewmen and fished practically the whole year by following the migrating shoals of herring. The Soviet herring catch has been large and is estimated to be close to 1.5 million barrels (200 pounds a barrel), valued at about US\$21.72 a barrel ex-vessel.

During the summer months the herring fleet fished off Jan Mayan, an island between Norway and Greenland; later in the season it moved to the east coast of Iceland; a few months later it was off the Faroe and Shetland Islands; and it operated off the Coast of Norway near Aalesund for the winter herring fishery.

The report states that the fishermen appear to be very competent and satisfied with their work. The crews on the mothership include women as cleaners and packers of the herring. Most of the vessels are new vessels built in Danish shipyards.

Poland was reported to have 525 vessels and a mothership of 800 tons in the fishing areas of the Atlantic Ocean and the North Sea. The Polish fleet has set a goal of 1,286,000 barrels in 1956.

ICELAND EXHIBITS AT INTERNATIONAL FISHERY TRADE FAIR

For the first time Iceland will exhibit its fishery products at the International Fishery Trade Fair, Copenhagen, Denmark, May 18-27. A special Fair Committee was formed by the Icelandic Government to organize prospective exhibitors at the Fair. Products exhibited consisted of cured and frozen fish, fish meal, cod-liver oil, shrimp, caviar, and canned fishery products, according to the Press Service of the International Fishery Trade Fair in Copenhagen.

Part of the exhibit was an information booth which provided the numerous visitors with details about the Icelandic fishery products available for export.

GREAT LAKES FISHERIES COMMISSION

FIRST MEETING: The first meeting of the six-member International Great Lakes Fishery Commission, created by Canada and the United States to coordinate efforts to protect the Great Lakes fisheries, opened in Ottawa on April 23, 1956. Canadian Fisheries Minister James Sinclair welcomed the Commissioners of the two countries at the opening session of the three-day meetings.

A nonregulatory body, the Commission was provided for in the Convention on Great Lakes Fisheries which was brought into force last October in Ottawa when an



Sea lamprey feeding on a trout.

exchange of instruments of ratification took place between Canada and the United States. The Commission may make recommendations, based on research findings, to make possible the maximum sustained productivity of the Great Lakes fishery.

One of the most important jobs facing the Commission is the coordination of the scientific research of various agencies engaged in the study of the Great Lakes fisheries, especially that dealing with the control of the parasitic sea lamprey which has caused serious damage to some

of the fisheries and which is a continuing threat to others.

Members of the Great Lakes Fisheries Commission for Canada are Dr. A. L. Pritchard, Director, Conservation and Development Service, Department of Fisheries, Ottawa; Dr. W. J. K. Harkness, Chief, Division of Fish and Wildlife, Ontario Department of Lands and Forests, Toronto; and Dr. A. O. Blackhurst, Manager, Ontario Council of Commercial Fisheries, Port Dover, Ont.

United States Commissioners are Claude Ver Duin, Mayor of Grand Haven, Mich., Lester P. Voigt, Wisconsin State Conservation Director, Madison, Wis., and John L. Farley, Director, Fish and Wildlife Service, U. S. Department of the Interior.

 $\mbox{Mr.}$ Farley was elected Chairman of the Commission for a two-year term, and $\mbox{Dr.}$ Pritchard Vice-Chairman.

The Commission will establish headquarters in either Ann Arbor, Mich.; or Toronto, Ont. The decision on the site will be made after quarters in both cities

have been investigated by a committee made up of Claude Ver Duin, Chairman of the United States section of the Commission, and Dr. A. L. Pritchard, Vice-Chairman of the Commission and chairman of the Canadian section. Pritchard and Ver Duin will report at the next meeting of the Commission, which will take place in Sault Ste. Marie, Ont., on July 30.

An executive secretary will be employed to supervise the work of the Commission. The post of executive secretary is open to residents of Canada and the United States, and will call for scientific and administrative qualifications of a high order. Until a permanent appointment is made, the work of the Commission will be directed by Dr. James Moffatt, Chief, Great Lakes Fishery Investigations, U. S. Fish and Wildlife Service, who will act in a temporary capacity.

The Great Lakes Fisheries Convention, ratified by Canada and the United States, is the fourth treaty in which both countries have come to bilateral agreement on fisheries conservation matters. The other conventions deal with salmon, halibut, and Pribilof sea!s.

This Convention provides for joint action in Great Lakes fishery research as well as in a program for the elimination of the predator sea lamprey in these waters. The Convention, which will have an initial duration of 10 years, provides for the establishment of a Great Lakes Fishery Commission made up of three appointees from each country.

Deep concern by both countries over the decline of some of the fisheries of the Great Lakes, and the serious damage being caused by the lamprey, brought about the recognition of the necessity for joint and coordinated efforts to determine the needs for the type of measures which may make possible the maximum sustained productivity of the Great Lakes fisheries.

This Convention area embraces Lake Ontario (including the St. Lawrence River from Lake Ontario to the 45th parallel of latitude), Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior, and their connecting waters. The Convention also applies to the tributaries of each of the above waters to the extent necessary to investigate any stock of fish of common concern, the taking or habitat of which is confined predominantly to the Convention Area, and to eradicate or minimize the population of the sea lamprey (Petromyzon marinus).

A nonregulatory body, the Commission may only recommend, on the basis of research findings, measures to make possible the maximum sustained productivity in the Great Lakes fisheries.

The Commission has the following duties: (a) to formulate a research program or programs designed to determine the need for measures to make possible the maximum sustained productivity of any stock of fish in the Convention Area which, in the opinion of the Commission, is of common concern to the fisheries of Canada and the United States of America and to determine what measures are best adapted for such purpose; (b) to coordinate research made pursuant to such programs and, if necessary, to undertake such research itself; (c) to recommend appropriate measures to the Contracting Parties on the basis of the findings of such research programs; (d) to formulate and implement a comprehensive program for the purpose of eradicating or minimizing the sea lamprey populations in the Convention Area; and (e) to publish or authorize the publication of scientific and other information obtained by the Commission in the performance of its duties.

In order to carry out these duties, the Commission may: (a) conduct investigations; (b) take measures and install devices in the Convention Area and the tributaries thereof for lamprey control; and (c) hold public hearings in Canada and the United States of America.

Electricity, poisonous chemicals, and ultrasonics are all being tested by Canadian and United States scientists as weapons in their war on the predatory sea lamprey, which is playing havoc with the stocks of lake trout and whitefish in the Great Lakes.

A temporary scientific committee appointed by the international Great Lakes Fishery Commission reported at the meeting that the most effective device developed for controlling the sea lamprey is an electrical barrier, placed across streams tributary to the Great Lakes, up which the lampreys go to spawn.

On the Canadian side 29 such barriers are in operation on Lake Superior and on Lake Huron. On the United States side there are 48 barriers on Lake Superior, 19 on Lake Michigan, and 1 on Lake Huron.

The committee reported that the lamprey-control network should be completed on Lake Superior this year. This would call for an additional 10 to 20 barriers on the Canadian side and 6 on the United States side. In addition, the Commission will this year build 55 barriers on Lake Michigan, and similar installations will be completed on Lakes Michigan and Huron in the following two years.

It is estimated that construction of electrical barriers on all lamprey-spawning streams flowing into all the Great Lakes should be completed by the end of 1960.

The first work is being done on Lake Superior because there are still sizable stocks of lake trout surviving there. In Lake Michigan the lake trout populations are virtually extinct while in Lake Huron all that are left are small numbers in Georgian Bay. The lake trout have also been greatly reduced in numbers in Lake Ontario. Catches of whitefish in all five of the Great Lakes are low, but it is not known exactly how much of the blame for this can be placed on the lamprey, as whitefish are particularly subject to random fluctuations.

The electrical device kills only mature lampreys as they ascend the stream to spawn. The scientists are now working on methods which it is hoped will destroy the younger generations which are not affected by the barriers.

In order to avoid duplication of effort, fishery biologists of both countries have been meeting frequently since 1946 to coordinate research and control measures. Out of hundreds of chemicals possibly useful for poisoning the young lampreys, the United States scientists have narrowed the field to the eight most probable poisons which could kill lampreys but which would not be toxic to other forms of wildlife or to human beings. In Canada, experiments are being made with ultrasonic devices, as well as the improvement of present control by means of the electrical barrier.

At the meeting the Commission appointed a permanent scientific committee, made up of biologists from both countries, to continue joint efforts to control the lamprey and also to develop and recommend a research program as the basis for management of all fisheries in the Great Lakes.



Canada

ATLANTIC SALMON REGULATIONS FOR 1956: No major changes in regulations or program for the coming year were proposed at the annual meeting of the Federal-Provincial Coordinating Committee on Atlantic Salmon held in Ottawa on February 17. However, the meeting was in favor of the formation of an advisory committee to be made up of representatives of the commercial salmon fisheries and angling organizations in the Atlantic provinces. Letters are to be sent to those

provinces suggesting that the commercial and angling groups in Quebec, Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland each appoint one member, making ten members in all. This advisory committee would meet with the coordinating Committee at the time of its annual meeting.

At the meeting the scientific subcommittee reported on the research carried out in 1955 and on the work done on the salmon streams. The subcommittee was instructed to continue its present program. The largest single project for the coming year is the construction of a fishway at a falls on the LaHave River in Nova Scotia, which is expected to double the productive area of the LaHave basin, adding about 280 square miles to the spawning area.

COMPLIANCE WITH CANNED FISH AND SHELLFISH IMPORT REGULATIONS REQUIRED: At a recent meeting of the Inspection Officers of the Canadian Department of Fisheries, it was brought out that a great number of exporters in shipping canned fish and shellfish to Canada are not complying with subsection 3 of section 28 of the Meat and Canned Foods Act -- Canned Fish and Shellfish and Cannery Inspection Regulations. The Canadian Consular General in a personal communication points out that the section in question reads:

"(3) No person shall import or attempt to import any canned fish or shellfish unless all marks on the cans which identify the canner, the date of packing, and the coding of the lot, are clearly stamped or stenciled on both ends of the cases or containers in which such cases are shipped; such marks shall also be listed on the affidavid prescribed by subsection (1).

The Canadian authorities point out that if exporters continue to disregard this regulation, the Canadian Department of Fisheries has no other recourse than to refuse entry to shipments until they are properly marked.

LABELING REGULATIONS FOR FRESH, FROZEN, OR PROCESSED FISH A-MENDED: The Fish Inspection Regulations (Section 59) of Canada have been amended, according to the Fisheries Council of Canada. The amended regulations are as follows:

- 59. (1) All containers in which fresh or frozen or processed fish is packed shall be correctly and legibly marked or labeled to indicate
 - (a) the vernacular name of the fish.
 - (b) the net weight of the contents, and
 - (c) the name and address of the person, firm or corporation by whom or for whom they are produced and packed or by whom they are distributed;
- (2) All wrappers for fresh or frozen or processed fish shall be correctly and legibly marked or labeled to indicate
 - (a) the vernacular name of the fish,
 - (b) the net weight of the contents unless such contents are to be weighed at time of retail sale,
 - (c) the name and address of the person, firm or corporation by whom or for whom they are produced and packed or by whom they are distributed, and, (d) the words "Product of Canada."

- (3) Marking or labeling prescribed by subsection 1(a), 1(b), 2(a), and 2(b) shall, in respect of other than wooden containers, be not less than three-sixteenths of an inch in height and shall appear on the main body or face of the container or wrapper.
- (4) Marking or labeling prescribed by subsection (1) shall appear on one end of a wooden container.
- (5) No person shall mark, label or package any fresh, frozen or processed fish in a manner that is false, misleading or deceptive.
- (6) Except as herein otherwise provided, containers and wrappers in which fresh or frozen or processed fish is packed for sale in markets outside of Canada may be exempted from any or all of the provisions of this section at the discretion of the Minister.

It is believed that "fish" in the Canadian regulations refers to both fish and shellfish.

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MESH REGULATIONS FOR NORTHWEST ATLANTIC TRAWLERS: Regulations governing mesh sizes in nets used by Canadian fishing trawlers and draggers in certain areas of the Northwest Atlantic will go into effect on January 1, 1957. The new mesh sizes are designed to conserve stocks of cod and haddock, reports the February 1956 Trade News, a Canadian Department of Fisheries publication.

Canada's Department of Fisheries has announced that the new regulations, recommended by the International Commission for the Northwest Atlantic Fisheries, will be similar to those in effect since June 1953 for the Georges Bank area off the New England coast, known as Subarea 5. The subareas to be affected next year are number 3 (Newfoundland fishing banks and waters adjacent to that province) and number 4 (Nova Scotia waters, the Gulf of St. Lawrence and the Bay of Fundy).

Because scientific investigation has shown that the stocks of fish in each of the subareas are distinct and separate, and that there is a slower growth rate in Subarea 3, different minimum mesh sizes are specified for Subareas 3 and 4. The mesh size in Subarea 4 is to be a minimum of $4\frac{1}{2}$ inches, similar to that already in effect in Subarea 5, but in Subarea 3 a 4-inch mesh size will be permitted. The nets affected are those used by all types and sizes of trawlers and draggers fishing for cod and haddock. The mesh sizes are based on the use of 102 millimeter manila twine, measured wet after use. Tables of equivalent mesh sizes when measured dry for other types of net material have been compiled and will be available from the Biological Station of the Fisheries Research Board of Canada at St. Andrews, N. B., or from the federal Department of Fisheries.

To prevent the impairment of fishery operations conducted primarily for species other than cod and haddock, the new regulations will permit the use of smaller mesh nets by vessels fishing for these other species. However, such vessels may have in possession on board only specified amounts of cod and haddock caught incidentally in the smaller-meshed nets.

Experiments in some years have demonstrated that the larger mesh sizes release as much as half the haddock now wasted at sea, with negligible loss of fish of marketable size. Wastage of small cod at sea is less serious than that of haddock, but as much as 25 percent by number have been discarded in some years in the Gulf of St. Lawrence area.

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MOBILE SCHOOLS SUCCESSFUL IN TRAINING NOVA SCOTIA FISHERMEN: During and after the last war modernization of the Nova Scotia fishing fleet was rapid and the new equipment in the form of boats, nets, and engines required the

establishment of training courses for the fishermen. The Nova Scotia fishermen



Canadian traveling marine engine school.

have always been competent, but new inventions and techniques which have come with mechanization—coupled with a modern economic system—demanded that these changes be mastered by any man who would earn his living by fishing. Following a survey of the needs of the fishermen, the Nova Scotia Department of Trade and Industry in 1946 in conjunction with the Department of Labor established a fisheries training program.

At first the program (opened to all bona fide fisher-

men) embraced navigation and engine maintainance, and became an immediate success. Later courses in the repair, design, and dimensions of nets were added. Then fishermen were encouraged to switch to vessels especially built to serve their needs. For this purpose the Nova Scotia Fishermen's Loan Board was set up to help finance the new operations.

Inspectors made sure that vessels so bought were constructed on sound lines

For the fisher-manhimself the larger unfamiliar vessels posed more new problems. Longer fishing range made necessary a greater knowledge of navigation. Strange nets and good gear require adaptation to new fishing techniques. Engine performance became of great im-



Graduates of the net and gear course prepare to test their skills.

portance. The courses were tuned to the stepped-up demand for knowledge.

Recently in Halifax the new <u>Bluenose Princess</u>—a 40-foot-long shopmobile trailer, big enough to accommodate $\overline{12}$ menfor gasoline-engine instruction or eight men for Diesel-engine instruction—was added to the training program. It was the second such shopmobile equipped to offer 4-week courses to the fishermen of Nova Scotia.

Since 1946, training in engine repair and maintenance and in navigation has been given to more than 1,200 fishermen in 30 fishing areas of the province. The success of the program may be measured also by the demand for these courses, which made it necessary to add the second shopmobile.

The use of a large trailer equipped for engine instruction is said to be unique on the North American continent. Many inquiries have come to provincial authorities for more information about it. Certainly it has proved of great service to the fishing industry in Nova Scotia. Often the fishermen bring their own motors to the school, where they overhaul them while learning how to take down the engines and make minor repairs. When they encounter major problems they are encouraged to send the parts to plants properly equipped for the type of repair needed.

The two shopmobiles now in operation are well-fitted for their work. In addition to the Diesel and gasoline engines which the instructors use for demonstration, they are actually fully-equipped machine shops. Both shopmobiles also contain living quarters for the instructor-drivers. They are heated by propane gas and can be set up at any place where electrical power is readily available.

The mobile navigation schools also operate four-week courses. Schools are limited to 15-18 trainees at a time. Instruction is given in the fundamentals of navigation, rules of the road, compasses, chart work, lights, and foghorns. The trainees also learn about aids to navigation such as loran, direction finders, echosounders and radiotelephones, tide tables, radio beacons, signaling, and magnetism.

Like the navigation schools, the net and gear schools are at present held in convenient halls or classrooms. But already plans are afoot to provide a trailer classroom for the navigation courses, and provincial fisheries officials are planning also for future expansion in the nets and gear school.

In this school the fishermen learn to design nets, to alter designs and dimensions to suit the towing power and speeds of their boats, and how otter doors and warps and nets themselves are likely to act in a given set of circumstances. Even the basic rules for splicing rope and wire are taught. When he is finished, he knows the proper designs of otter trawls and the adaptation of any design to the methods and techniques of particular kinds of fishing.

Most classes are fitted into the off-season for fishing in the various districts. While they are attending the classes, the fishermen are given a subsistence allowance ranging from \$1.50 a day for single trainees living at home to \$3.75 a day for married men away from home. The only requirement in addition to being bona fide fishermen and residents of Nova Scotia is that they attend classes regularly and work seriously.

It all adds up to the fact that Nova Scotia's fishing industry is advancing with mighty strides. By 1954 the landed value of Nova Scotia fish was more than four times the prewar figure. The quantity has increased by close to 40 percent. Forty-three modern long-liners and 30 draggers have been added to the fleet. Severalnew fish-processing plants have been put into operation and millions of dollars have been spent, modernizing and expanding existing plants.

Note: Abstracted from article by A. C. Rhydwen in March 1956 Trade News, a publication of the Canadian Department of Fisheries.



Chile

NEW WHALE PROCESSING PLANT: A Santiago newspaper (March 26, 1956) reports that a new whale processing plant will soon be completed at Iquique in the northern part of Chile by one of the country's most important whaling companies. The new plant is expected to double the company's processing operations by the latter part of 1956. (Foreign Trade, April 28, 1956, a publication of Canada's Department of Trade and Commerce.)

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REGULATIONS FOR EXPLOITATION OF SOUTH PACIFIC WATERS APPROVED: The Chilean Diario Oficial of April 7, 1956, published Decree No. 102 of March 9, 1956, approving the Regulations for Permits for Exploitation of the Riches of the Southern Pacific as drawn up at the tripartite conference held in Quito in December 1955 between Chile, Peru, and Ecuador, the United States Embassy at Santiago reports (dispatch dated April 11).

Note: See Commercial Fisheries Review, January 1956, p. 42.



Ecuador

FIRST NATIONAL FISHERY CONGRESS HELD FEBRUARY 22-24: Ecuador's First National Fishery Congress, organized by private fishing interests, was convened in Quito February 22-24. The congress met with considerable support from the Government and passed a number of resolutions designed to stimulate Ecuador's fishing industry. A number of the resolutions adopted by the congress would have the effect, if enacted into law by the Ecuadoran Government, of further restricting foreign fishing operations in the territorial waters claimed by Ecuador, according to reports.

German Federal Republic

NEW FISHERIES SERVICE VESSELS: The Fish Section of the West German Federal Food Ministry has placed an order with a shippard in Cuxhaven for a new



The Meerkatze, a West Germany fisheries service vessel.

fisheries service vessel. The hull of the new ship will resemble that of the fisheries research vessel <u>Anton Dohrn</u>, placed in service about a year ago. Superstructure will be similar to that of the <u>Meerkatze</u>, another fisheries service vessel operated by the government. The new ship will be about 186 feet over-all, with a 30-foot beam. The new ship will have a 1,000 hp. oil-burning steam engine, and a crew of 26. The ship's keel was to be laid in May 1956; the new vessel should be in service by mid-1957. The total cost of the vessel is expected to be about US\$712,000, states a March 12 dispatch from the United States Consul at Bremen.

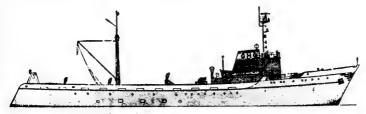
The Food Ministry is reported to have recently purchased a Hamburg fishing trawler of 330 gross tons to be converted into another fisheries service vessel.

This vessel will replace the obsolete service ship <u>Frithjof</u> (242 gross tons) which was built in 1916. The converted vessel will be put into service in July 1956.

The two fisheries service vessels (Meerkatze and Frithjof) fill a number of needs for German fishing vessels and their crews on the high seas are frequently giving help to fishing boats of other nations. The service vessels carry small hospitals staffed with qualified personnel to provide medical aid to fishermen on the high seas. The vessels are also equipped to give technical assistance to trawlers. The service ships carry meteorological observation stations and laboratories to conduct experiments and research in the field of marine biology and oceanography. During the six-year period from 1948 until 1954, the two ships made 121 trips, spent 2,595 days on the high seas, and medical aid was given in 7,183 cases.

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NEW TYPE FACTORYSHIP TRAWLERS TO BE BUILT: Following some successful trials of factory-type fishing trawlers by the British and also the recent delivery of the 12th factoryship trawler by a shipyard in Kiel to the Soviets, the West German deep-sea fishing industries have apparently decided to fall in step with the trend towards this system of fishing. Three trawler companies in Brem-



New type of "semifactory trawler" being built in West Germany,

erhaven have placed orders with a local shippard to build a new type of fishing trawler which has been described as an interesting compromise between the traditional type of trawler and the latest version of a factory fishing vessel.

One compelling reason for this development is the length of the fishing trips made by German trawlers. The long trip makes it extremely difficult to land fish in a fresh condition and to meet the public's ever-growing demand for better-quality seafood. German trawlers travel for about one week to reach their fishing grounds for demersal fish (ocean perch, cod, haddock, etc.) off the Icelandic and Greenland coasts. One week of fishing is followed by a one-week return trip. The fish caught during the first days at the fishing grounds are about two weeks old before they arrive in port, and often a substantial percentage of the early catch has to be sold to the fish meal factories, a March 15 dispatch from United States Consul General in Bremen states.

Several factors have delayed an earlier switch to factoryships in West Germany. Apart from the hotly-disputed question of the economy of such ships, the cost of the vessels, which is estimated to amount to more than US\$710,000 has been one of the major obstacles. The German Federal Government is subsidizing interest rates for loans to build factoryships and this fact has gone a long way to facilitate the necessary investments by the trawler companies.

The length of the new type of "semifactory trawler" between perpendiculars is about 200 feet, width about 30 feet, height up to the top deck about 22 feet, draft about 15 feet. The ships will be powered by two Diesel motors each of 650 hp. One ship will be equipped with two horizontal Voith-Schneider propellers making the

installation of a rudder superfluous. The other two ships will be built with the conventional-type propeller and rudder. The ships will have two decks. The top deck will carry the usual type of catching gear. The lower deck will carry the fish-processing machines, including a 15-ton fish meal plant, fish-oil extractors, filleting machines, and sharp-freezers. Only the fish caught during the first few days will be processed. The rest will be transported to the home ports fresh, in fish holds capable of carrying 600,000-700,000 pounds of fish. The fish meal and oil plants will permit the vessels to utilize the waste from the filleting and cleaning operations.

The outstanding feature of the new vessels will be the stern trawl now in use on British and Soviet factoryships. Instead of fishing across the broad side of the ship, the trawl net will be towed over the stern. A slanting slide facilitates the bringing in of the net. Through two chutes the catch is dumped on the lower deck for dressing and processing. The total crew of this type of ship, including fish processors, will number about 33.



Japan

SALMON FISHING FLEETS TO FISH IN NORTH PACIFIC AS SCHEDULED: Japanese fishing companies reportedly intend to fish for salmon as originally scheduled in the general area affected by the Soviet Union's recent announcement. They plan to dispatch 19 fleets, five more than last year, operating some 500 catcher boats. Normally these salmon fleets leave Japan for northern Pacific waters in the first week of May.

The Dai Nippon Fishery Association has already presented the Japanese Government with a petition protesting the action of the Soviet Union and, because of the vagueness of the Soviet pronouncement with respect to the area affected and specific measures to be taken, is apparently willing to risk fishing in the area, in support of its contention that the unilateral action on the part of the Soviet Union is a violation of international law.

The Association also stated that the companies are taking the risk on their own and are not "troubling" the Japanese Government. The Association is hopeful that a settlement of this question may be reached before the fleets are dispatched.

The Japanese Government has presented a strong protest to the Soviet Union and has publicly announced its willingness to discuss fishing matters with the Soviets without regard to the other unsettled issues pending between the two countries.

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SALMON LONG LINERS ASK POSTPONEMENT OF LICENSING: The chairman and 16 representatives of the Committee for promoting salmon long-lining in the North Pacific visited the Japanese Fisheries Agency and members of the Diet from Miyagi Prefecture in March to request that the application of a licensing system for salmon long-lining south of 48 degrees north latitude, which was scheduled to begin in April, be postponed for one year. (Nippon Suisan Shimbun, March 8.)

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TUNA GROUNDS IN ARABIAN SEA SURVEYED BY TRAINING SHIP: The Japanese training ship Shunkotsu Maru (577 tons) of the Ministry of Agriculture and Forestry's College of Fisheries at Shimonoseki returned on March 2 from a training cruise to the Arabian Sea. The ship sailed about November 15 with 47 students

aboard and made a survey of the tuna long-lining grounds in the Arabian Sea at the western extreme of the Indian Ocean. Stops were made at Singapore, Colombo, Bombay, and Keelung en route, according to the March 8 <u>Nippon Suisan Shimbun</u>, a Japanese newspaper.

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SWORDFISH EXPORTS TO BE HANDLED BY ASSOCIATION: All exports of frozen swordfish from Japan will be handled by the Japan Frozen Food Exporters Association, beginning April 1, 1956. Individual Japanese exporters may designate their United States importer, but if no designation is made the Association will make the selection. The plan is not designed to eliminate United States importers, but only to control export volume and prices. Japanese exporters are no longer permitted to deal directly with United States importers, according to a March 23 dispatch from the United States Embassy in Tokyo.

For the Japanese fiscal year 1956, 8 million pounds will be exported at prices varying from 18 cents a pound for 30-pound slabs or fillets to 28 cents a pound for slabs of 100 pounds or more.



FOREIGN SHRIMP BOATS OUTSIDE JURISDICTIONAL WATERS: During a press conference, held March 14, the Senator from the Campeche province of Mexico stated, that most of the fishing by foreign boats off Campeche takes place outside the Mexican 9-mile jurisdictional limit. The Mexican Coast Guard has been instructed to maintain the 9-mile limit.

Foreign ships fishing inside the 9-mile limit will be apprehended and made subject to Mexican law. International practice permits foreign boats to seek haven in Mexican ports without violating the law in case of storms or distress, a March 15 dispatch from the United States Embassy in Mexico City states.

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SHRIMP SEASON ON PACIFIC COAST NORTH OF MAZATLAN ENDED: The west coast of Mexico north of Mazatlan was closed to shrimp fishing on March 15, 1956. This area includes the most productive area on Mexico's west coast. The southern Pacific coast area of Salina-Cruz will remain open and some production can be expected from this area until June, at which time fishing usually ends due to poor catches.

The area from Mazatlan north will close for 30 days and the closed period may be extended 30 additional days which will carry over into the non-productive season.



Norway

AUREOMYCIN USED TO PRESERVE FRESH FISH: Experiments conducted by the biological-chemical division of the Norwegian Fisheries Directorate on preserving fresh fish with aureomycin have proved successful. Newly-caught fish have been kept fresh for 19 days by use of ice which contains small quantities of crude

aureomycin. With ordinary ice the fish can be kept only up to 12 days, states a United States Embassy dispatch (April 13) from Oslo. Because the aureomycin is destroyed in cooking, consumption of the treated fish will not build up resistance to the drug.

If the method is practical, it will be a significant advantage to Norwegian fresh fish exports, especially for shipping fresh cod from North Norway to the large British market.

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FISH EXPORT TRADE PROSPECTS GOOD: Prospects are good for Norwegian exporters of fishery products, according to a March 16 dispatch from the United States Embassy in Oslo. During 1955 the value of fishery products exports reached a record total of about US\$132.7 million (947.5 million kroner).

Exports of frozen fillets have improved because of a pick up in sales during February 1956. Large stocks had been accumulated at the beginning of 1956, due to the relatively high price asked for Norwegian frozen fillets. It was expected that all stocks would be sold by the end of April 1956.

The export price for dried fish was reduced by US\$1.60 a 100 pounds (25 kroner a 100 kilos), bringing the price down to about US\$26 a 100 pounds (409 kroner a 100 kilos) f.o.b. Bergen. This price reduction was necessary in order to enable Norwegian exporters to compete with Icelandic dried fish. Tariff reductions by one of Norway's chief customers (Nigeria) will permit the price reduction with very little loss to the exporters. It was believed that the 16,000 metric tons of dried fish on hand as of January 1 will be sold without difficulty.

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HIGH RAW FISH PRICES CAUSE FROZEN FISH PRODUCTION CUTBACKS: The high price of raw fish has caused most of North Norway's freezing plants to cutback production, according to director of Norsk Frossenfisk A/S. For direct delivery to the plant, the freezing plants pay higher prices to the fishermen for raw fish than the minimum of 70 øre per kilogram (4 U.S. cents a pound) fixed by the Government. The freezing plants are compensated by refunds from the Price Regulation Fund for Fish up to a fixed quota for each plant. If the plant uses more fish than its quota allows, it receives no refund, an April 13 United States Embassy dispatch from Oslo points out. The large catches of cod this year have made more fish available to the plants than provided for in the quotas, hence the plants are cutting production back to the quota level in order to avoid losing the benefit of the refund.

The high price of Norwegian frozen fish fillets has not hurt sales on most foreign markets, but reports indicate that it is impossible to compete profitably on the United States market. On the other hand, the Ministry of Fisheries is more inclined to blame the sales decline in the United States on current low market prices rather than on high raw fish costs in Norway.

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SALTED HERRING PRODUCTION FOR 1956 SEASON: The Norwegian Winter Herring Salters Association announced early in April that 600,000 barrels of salt herring would be packed for export from the 1956 season's catch, compared with 613,000 barrels from the 1955 season. Shipments of about 450,000 barrels (50,000 metric tons) to the Soviet Union should be completed by the end of May. Most of the rest of the herring has already been sold to several other smaller markets.

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SHRIMP INDUSTRY: Shrimp fishing in Norway is based on the deep-water shrimp, Pandalus borealis. It is usually found in deep fjords and in submerged

channels of the coast on soft clay bottoms. The commercial fishery for shrimp is conducted in depths of about 50-220 fathoms, states an April 19 report from the United States Embassy in Oslo.

Table 1 - No	rwegian Shrim	p Catch, 1953~1955
Year	Quantity	Ex-vessel Value
	Metric Tons	US\$1,000
1955	. 5,533	2,240
1954	4,961	1,890
1953	. 3,763	1,428

The shrimp grounds extend the length of the Norwegian coast from the Skagerak in the south to Varangerfjord in the north. There are no seasonal limitations and fishing goes on throughout the year. The boats used in shrimp fishing are from 20-50 feet long, the smaller boats operating in the more protected fjords while the larger boats are used on the open sea. Shrimp trawl nets of 13 to 16 fathoms in length are used.

There are many small receiving sheds and freezing plants along the coast where shrimp are fished most extensively. There are also a number of small canneries located near these installations whose chief activity is canning shellfish and small herring, brisling, etc. Most of the shrimp is either consumed in Norway or exported fresh, only a small percentage of the catch is canned (see tables).

Table 2 - Norwegian Fresh and Frozen Shrimp Exports, 1953-1955 Quantity Value Metric Tons US\$1,000 1,795 1,876 1955..... 1954..... 1,585 1,568 1953..... 1,512 1,204 1946-50 Avg... 1,184 672

Table 3 - Norwe		
Shellfi	sh, 1953-195	5
Year	Quantity	Value
	Metric Tons	US\$1,000
1955	1,891	2,338
1954	1,713	1,988
1953	1,432	1,694
1946-50 Avg	1,468	1,344

In the last few years there has been a considerable increase in the catches of shrimp, particularly in North Norway, although several productive grounds have been opened up on the southern coast. The commercial size of Norwegian shrimp varies from 9 to 12 centimeters (3.5-4.5 inches) total length, with 90-160 heads-on shrimp a pound. The smaller shrimp are ordinarily used for canning. The number per pound varies somewhat with the seasonal variations in the size of shrimp caught.

Most of the Norwegian shrimp is exported iced or frozen in the shell, although in the last few years there has been a growing market for frozen peeled shrimp in cartons or plastic containers. The United Kingdom and Sweden are the chief markets, accounting for 96 percent of Norwegian iced or frozen shrimp.

Statistics on exports of canned shrimp are not available. Shrimp is included with crab meat, lobster, and crayfish in the category of canned shellfish (table 3). The United Kingdom and Sweden buy about 80 percent of Norwegian canned shellfish exports.

Shrimp fishing in Norway is usually carried out from small boats manned by one or two fishermen. There are no government supports, loans, guarantees, or special concessions for shrimp fishing other than those for Norwegian fishing in general. The shrimp industry has, however, received some assistance from government research organizations in locating and mapping new shrimp grounds.

There are no foreign vessels or foreign capital engaged or invested in the shrimp fishery of Norway.

The potentialities for expansion of shrimp fishing in Norway are good, particularly in North Norway where operations up to now have been confined to the coast and a few fjords near freezing plants. There are also good possibilities for more extensive operation farther out to sea, for example near Spitzbergen and Bear Island where there has been no shrimp fishing previously. The extent of commercially-profitable shrimp fishing grounds in the Norwegian Sea have not been accurately determined, but cursory investigations by research and private vessels indicate that there are considerable areas where fishing could be expanded.

Market conditions for shrimp are favorable both in Norway and abroad. Exports will probably continue to rise at about the same rate as production. As new packing and freezing methods are adopted by the small plants along the coast, a larger proportion of the catch, both fresh and canned, will be exported.

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REVIEW OF THE FISHERIES, 1954-55: The total catch of all fishery products by Norwegian fishermen in 1955 was 1,635,233 metric tons (about 2.3 billion pounds). This was 269,648 tons less than the record catch of 1954. The catch for 1955 was

Table 1 - Norwegiar and Ex-Vess	Fishery Products sel Values, 1951-55	
Year	Quantity	
	1,000 Metric Tons	US\$1,000
1955	1,635	84,012
1954	1,905	79,490
1953	1,398	68,025
1952	1,670	73,093
1951	1,669	68,949

the fourth highest on record, but the value of the 1955 catch (about US\$84 million) was the highest ever recorded, according to the January 1956 Norwegian Fishing News.

During 1955 the catch of herring and sprats decreased 332,222 tons or 23 percent under the 1954 total. The win-

ter herring fishery produced 965,413 tons (valued ex-vessel at US\$27.3 million)--126,317 tons and US\$0.9 million less than the record production of 1954. The fat and small herring fisheries were considered a failure in 1955. The climatic con-

Table 2 - Norwegian	n Fishery I	Products Lar	ndings by F	ish Groups
	198	55	19	54
Type of Catch	Landings	Ex-vessel Value	Landings	Ex-vessel Value
Herrings &	1,000 Metric Tons	US\$ 1,000	1,000 Metric Tons	US\$ 1,000
sprats	1,138	34,481	1,470	38,765
products	249	25,773	204	19,572
Other kinds 1/	248	23,758	231	21,154
1/ Chiefly haddock, pollock, hal	ke, ocean perch,	and halibut.		

ditions were not favorable to these fisheries. The fat-herring fishery yielded 35,312 tons, or a fourth of the 1954 catch; and the small-herring fishery, 100,994 tons-half of the 1954 catch. The 1955 catch of sprats was 5,904 tons, compared with a catch of 8,861 tons in 1954 and 13,297 tons in 1953. The sprat catch was light, and failed especially during the summer of 1955 in the main brisling-sardine packing season.

The total catch of Icelandic herring, mostly cured, in 1955 was 24,200 tons, an increase of 4,151 tons over the 1954 catch. The 1955 trawl-herring fishing (on the Fladenground) yielded 5,077 tons, or 1,839 tons more than in 1954.

Due to price increases, the ex-vessel value of the herring and sprat catch was at a high level. The average winter herring price was about US\$1.30 per 100 pounds, compared with US\$1.12 per 100 pounds in 1954.

The catch of cod and cod byproducts ranked second to the herring group in 1955 and exceeded the 1954 catch by 44,867 tons.

Note: Values converted to US\$ equivalents on the basis of 7.143 kroner equal US\$1.

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SOVIET DELEGATION TO STUDY FISHERIES: A Russian fisheries delegation of 12 men, headed by the Minister of Fisheries, arrived in Oslo on March 11 by air on a study visit at the invitation of the Norwegian Government.

The visit, originally due to start on February 3, was postponed by the Russians after 16 Russian herring boats had been arrested on charges of fishing in Norwegian waters.

The program also was changed. Instead of studying the Norwegian herring fisheries, which were at their peak in February, the delegation was scheduled to study North Norway's cod fishing (The Fishing News, March 16.)

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WINTER HERRING CATCH SETS RECORD: The Norwegian winter herring fishery ended about April 1 with an all-time record catch of 1,144,000 metric tons (about 2.5 billion pounds). This record catch compares with 950,267 tons in 1955 and 1,088,000 tons in 1954. The value of the 1956 winter herring catch was close to US\$35 million as compared with US\$28.1 million in the previous record year of 1954, states an April 6 dispatch from the United States Embassy in Oslo.

On February 14 the Norwegian winter herring fishery turned from the sloe herring to the spring herring. At the beginning of the winter herring fishery this year, the hydrographical conditions were unlike those prevailing during the previous seasons. After the first reports from the Norwegian research vessel G. O. Sars of herring shoals approaching coastal waters, 16 days elapsed before the fishing made actual progress. The weather conditions were not favorable, but the principal reason for the poor catches were extraordinary hydrographical conditions. The sloe herring shoals, however, appeared from January 24 until February 14 at the usual fishing places and weather conditions were good. The winter herring fisheries extend generally from January to April.

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TRAINING SCHOOLS FOR FISHERMEN: Five Norwegian State-operated vocational training schools for fishermen, claimed to be the most up-to-date in the world, have begun a new year with full enrollment. They provide intensive courses lasting from five to ten months.

A total of 120 of the 240 students in the five schools take the head-fisherman course, 60 the motor-tender course, and 60 the cooking course. Other subjects are marine plant life, fish biology, migrations, and fluctuations in supply.

A new project is a program for advanced education of university graduates who have to deal with fisheries questions, launched by the Society for the Promotion of Norwegian Fisheries, which also sponsors a broader fisheries educational program for the public. This includes the Bergen Museum of Fisheries and a fisheries section in the Trondheim Science Museum.

A professor of marine biology at Oslo University says the fisherman's training provided in Norway is on a higher level than in any other country. "The industry is in process of rapid development. By continually relaying the latest research results to the working fishermen, the vocational schools and other educational schemes will be able to stimulate further growth of the industry. That Norway has pioneered in this field is due to the close and varied cooperation among fisheries trade organizations, government agencies, and private institutions." (The British periodical, The Fishing News of March 9.)

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WINTER COD CATCH GOOD: The 1956 Lofoten winter cod fishery ended about April 20 with a total catch of 63,500 metric tons. The catch was valued at US\$7.7 million (55 million kroner). The total catch for 1956 winter season at Lofoten exceeds the 1955 and 1954 catches by close to 20,000 tons, but is lower than the average catch since the end of World War II.

The cod catch at Lofoten plus the catch from south of this area amounts to 113,700 tons as compared with a total catch of 83,100 tons in 1955. Of this year's cod catch, 40,100 tons have been sold for drying, 56,300 tons for curing, and 17,300 tons for the fresh and frozen trade. The cod roe was disposed of as follows: 3,214 tons for salting; 1,345 tons for canning and the fresh trade. The cod-liver oil production amounted to 5,300 tons. (Fiskets Gang, April 26, 1956.)



Panama

PINK SHRIMP RETURN TO THE GULF OF PANAMA: The "pink" shrimp, which were in the Gulf of Panama for several days early in March, returned later in the month. The catches were heavy and if the strong northeast winds continued another ten days as expected, Panama's catch of "pink" shrimp was expected to reach 1 million pounds, according to information received by the United States Embassy in Panama (March 22) from the Panamanian Government Fisheries Research Laboratory. Catches in previous years have not exceeded 300,000 pounds.

Because the Panamanian fishing industry was better prepared this year to handle the shrimp, the boats have been able to bring in catches of 5,000 to 7,000 pounds each. As much as 80,000 pounds of shrimp have been packed in one day as compared to the previous record of 30,000 pounds. Approximately 300,000 pounds of "pink" shrimp were caught up to the date of dispatch.



Peru

EXPORTS TUNA TO WEST GERMANY: The part of the Peruvian fishing industry engaged in the freezing of tuna for export was encouraged by a recent purchase of frozen tuna for export to West Germany. The possible expansion of the market for both frozen and canned tuna in Europe would help to offset the weaker market for these products in the United States, according to reports, states a February 24 dispatch from the United States Embassy at Lima.



Portugal

FISHERIES TRENDS, NOVEMBER 1955: Sardine Fishing: The catch of the Portuguese sardine fleet declined seasonally in November 1955 to 7,426 metric tons, or about 31 percent less than the October 1955 catch. The November 1955 sardine catch was valued at about US\$1.2 million ex-vessel as compared with US\$1.4 million in October 1955.

The sardine canning industry absorbed 63 percent (4,651 tons) with most of the balance consumed fresh. The port of Matosinhos lead all others with a catch of 4,816 tons of sardines and contributed 4,062 tons (ex-vessel value US\$704,600) to the canning trade.

Other Fishing: The landings of fish other than sardines totaled 956 tons, valued at US\$73,412 ex-vessel. The catch of fish other than sardines was 97 percent chinchards (924 tons), followed by bonito (21 tons), and 11 tons of mixed mackerel, anchovies, and tuna, the February 1956 Conservas de Peixe reports.

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<u>CANNED FISH EXPORTS</u>, <u>JANUARY-NOVEMBER</u> 1955: Portuguese canned fish exports totaled 6,522 metric tons (343,200 cases), valued at US\$3.4 million, during November 1955; and 57,223 tons, valued at US\$29.0 million, during January-November 1955.

Portugal's exports of canned fish in November 1955 declined about 18 percent when compared with the previous month. During January-November 1955 Germany continued as the leading receiver with US\$5.5 million of canned fish (about all sardines in oil), followed by Italy with US\$4.4 million (principally sardines and tuna), Great Britain with US\$4.2 million, and the United States with US\$3.6 million (principally 3,015 tons of sardines in oil or sauce, 39 tons of tuna and tunalike fish in oil, and 1,765 tons of anchovies). Ex-

Portuguese Canned Fish and Com			nber 19	55	
Species		Nov. 1955		JanNov. 1955	
	Metric Tons	1,000 US\$	Metric Tons	1,000 US\$	
Sardines in olive oil Sardinelike fish in olive	5,489	2,704	46,233	22,528	
oil Sardines & sardinelike	470	404	4,394	3,113	
fish in brine	90	16	1,822	343	
Tuna & tunalike in olive oil	192	151	2,081	1,538	
Tuna & tunalike in brine	137	67	713	360	
Mackerel in olive oil	128	73	1,430	860	
Other fish	16	11	550	297	
Total	6,522	3,426	57,223	29,039	

ports of canned fish to these 4 countries (during the Jan.-Nov. period) amounted to 58.8 percent of the total exports.

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<u>CANNED FISH PACK</u>, <u>JANUARY-SEPTEMBER</u> 1955: The pack of canned sardines in oil or sauce for January-September 1955 amounted to 18,214 metric tons

Product	Net	Canner's	Product	Net	Canner's
Product	Weight Value		Product	Weight	Value
	Metric	1,000		Metric	1,000
	723	US\$ 112		Tons	US\$
Sardines in brine	723	112	Tuna in brine	69	33
Sardines in olive oil or sauce	18,214	9,642	Tuna in olive oil	833	695
Sardinelike fish in brine	1,995	587	Tunalike fish in olive oil	94	61
Sardinelike fish in oil	2,672	1,458	Other species (including shellfish)	560	293
Anchovies, rolled & fillets	1,038	1,111			
Continued in opposite column			Total	26,198	13,992

(net weight). The September 1955 pack was 4,797 tons, about 17 percent higher than the 4,105 tons packed in August 1955.



Spain

FISHERY TRENDS, MARCH 1956: The coastal fishermen of Spain had a poor winter due to severe weather and the lack of fish in the coastal waters. The larger more seaworthy offshore vessels fared better and catches were about average for this period of the year.

The anchovies, which are important to both the fishermen and the canners, reappeared late in March in the northern fishing areas and helped to alleviate the economic depression of the coastal fishermen.

The general salary increases in Spain made effective by law on April 1, 1956 (5-6 percent for fishermen) will have little effect on the incomes of the fishermen because their income is largely based on a share of the value of the catch. The take-home pay of the fishermen is estimated to be between US\$49.31 (1,500 pesetas) and US\$65.72 (2,000 pesetas) a month, states an April 16 report from the United States Consul at Bilbao.



Sweden

CANNED SARDINES SOLD TO EAST GERMANY: Shipments of canned sardines to East Germany by the Swedish sardine factories in Bohuslan in 1956 totaled US\$485,000 in value. The last delivery of sardines under the 1956 quota fixed by the Swedish-East German trade agreement was loaded in Stromstad on April 3, 1956, when three sardine factories in Stromstad together shipped 1,100,000 cans, representing a total value of US\$116,000.

Under the trade agreement, shipments of sardines from Sweden to East Germany in 1957 may total US\$872,000, but the Sardine Factories' Association does not yet know how much of this quota will be utilized, according to an April 5 dispatch from the United States Consulate at Goteborg.

Note: Values converted to US\$ equivalents on the basis of 1 Swedish kroner equals US\$0,194.



Union of South Africa

FISHERIES TRENDS, MARCH 1956: Fishing in Union of South African waters improved quantitatively and qualitatively in March 1956 as compared to a disappointing catch and seasonally poor quality the previous month. Fish canneries were not working to full capacity, but their output was said to be substantial.

Prices of fish oil improved; those of fish meal declined slightly during the month.

Spiny lobster production remains satisfactory, with overseas demand for canned packs firm. Export prices to the United States of South African frozen spiny lobster tails (large and medium) were reported to have increased over the past few

months to \$1.05 per pound c.i.f. New York. Small sizes remained around 85 cents per pound c.i.f. New York, an April 5 dispatch from the United States Consular General at Capetown reports.

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FISH STICK SALES PROMOTED BY INDUSTRY: One of the most important developments in the South African fishing industry during 1955 was the major effort to promote the sales of fish by means of Union-wide advertising and publicity, states the February 1956 South African Shipping News and Fishing Industry Review. This campaign, now in full swing, is doing much to make the people of South Africa more fish conscious. It has been conducted simultaneously with the development of quick-frozen fillets and fish sticks by a processing firm. Quick-frozen fish, and especially fish sticks, have caught the imagination of the housewife, and have brought another important product into the seafood field.

Much of the success of fish sticks, sales of which have increased many times over since their introduction just over a year ago, has been due to the invention of an appealing little "fishy character" which appears on every package of fish sticks. This character is becoming as well known to the South African child as Donald Duck.

In addition to the producer's brightly-colored packages, the character is to appear on key rings and in the form of children's decals and in a children's painting and story book. This attractively-produced book with its gay-colored cover is being sold over grocery and fish-shop counters. The text carries no direct advertising of fish sticks, which are not mentioned anywhere, but carries the advertising theme unerringly and with great subtlety into the home. Attractive window displays and effective point-of-sale advertising are also employed.

Along with national advertising in all the principal newspapers and periodicals, an editorial publicity campaign is being conducted by a public relations consultant. This seeks to bring new ways of using and preparing fish, especially quick-frozen fish, before the housewife by means of articles and recipes in the editorial pages of newspapers and magazines.

The South African firm recently gave a most successful lunch at a Cape Town hotel for the Cape Town columnists, women's page editors, and cookery writers. The dishes served consisted of quick-frozen fish and fish sticks. Films of aspects of trawling were shown to the guests before lunch.

The latest public relations development is a "Fishstick Bar" which will be an attraction at the Community Carnival at De Waal Park, Cape Town, this month. Cooked fish sticks will be sold to the many thousands expected to attend, the proceeds to go to the Community Chest.

It is hoped to use this "Bar" at other public occasions, including the "Home That South Africa Built" exhibition at Goodwood in April.

On the practical side of bringing fish sticks to the attention of the housewife, cookery demonstrators are being employed. They demonstrate to housewives cooking of fish sticks at shops in all the main centers.



United Kingdom

ELECTRONIC EYE FOR MID-WATER TRAWL: An electronic "eye" which may make mid-water trawls a commercial proposition is being used experimentally by the Hull trawler <u>Benvolio</u>. The equipment which can be lowered to the exact depth of a fish shoal has been used experimentally by the <u>Benvolio</u> during the last three months. "It is the first of its kind in the world. ...

"If its first implications are correct, it may well revolutionize fishing. In some cases it might double the catch," The Fishing News (February 10) states.

The manager of the trawler company's fishing industry branch claims the electronic eye can determine the depth of water under a ship; gauge the depth of any intervening shoals of fish; gauge the depth of the trawl; show what fish, if any, are going into the trawl; and show what fish are being missed in a horizontal direction. You can easily describe it as a four-way eye," he said. "All depth readings are recorded in the wheelhouse. Early experiments have already proved most successful. To operate mid-water trawls successfully trawler skippers must know at what depth shoals are. We believe the eye answers the problem and it is a distinct commercial possibility."

The equipment will be available commercially at the end of this year. Rental cost for a one-year period is understood to be about US\$840.

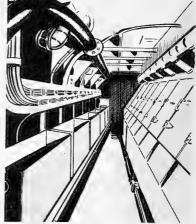
The British Ministry of Agriculture and Fisheries has been observing experiments with great interest. In addition, the Ministry has conducted its own experiments on Lake Windermere.

* * * * *

EXPERIMENTAL FREEZER-TRAWLER COMPLETES TRIP: The experiment in the quick freezing of fish at sea carried out by the trawler Northern Wave apparently has been successful.

The trawler left Grimsby, England, on December 31 and returned in January after spending eight days on the Norwegian fishing grounds. It was the vessel's first voyage since being equipped with special facilities for quick freezing, and a total catch of about 329,000 pounds was reported. Of this total about 70,000 pounds was quick frozen while the trawler was on the fishing grounds. This portion of the catch was thawed out and sent to inland dealers who were asked to report later on the reactions of customers.

The Northern Wave was chosen for experiments in quick-freezing at sea sponsored by the White Fish Authority and the British Trawlermen's Federation. The vessel carried a 23-man crew and three scientists from the Department of Scientific and Industrial Research who acted as instructors to the crew in how to handle the refrigeration machinery.



On the right of the above illustration is a bank of doors enclosing some of the quick-freeze compartments on the Northern Wave. On the left are the freezing cans into which the fish are placed for transfer to the cold storage room that is separately refrigerated by pipe grids at -200° F.

The experiment is designed to make the fishing grounds off Greenland and Newfoundland more accessible to British trawlers by enabling the boats to freeze the first part of the catch. At present the catch for the first few days' fishing on these grounds has been wasted due to spoilage. (United States Embassy in London, dispatch dated February 13 and the January 6 issue of
The Fishing News">https://example.com/html/>
The Fishing News, a British trade periodical.)

* * * *

LOANS TO FISHING INDUSTRY, 1954-55: The British White Fish Authority loans to fishing vessel owners for the 12 months ending March 31, 1955, increased sharply over the 12-month period ending March 31, 1954. Loans for the purchase of new vessels were US\$1,725,000 and for the purchase of new engines amounted to US\$56,000, according to a March 12 dispatch from the United States Embassy in London. During the year ending March 31, 1954, White Fish Authority loans for the purchase of fishing vessels were US\$439,000, and for the purchase of engines US\$19,000.

Total loans issued up to March 31, 1955, were US\$2,240,000, and commitments outstanding on that date in respect to loans or balance of credits intimated were estimated to be US\$2,484,000. Loans refunded and paid over to the Minister of Agriculture and Fisheries totaled US\$78,000.

By March 31, 1955, applications for loans had been approved on 71 vessels between 70-140 feet in length, 154 vessels under 70 feet in length, and 118 engines for all craft up to 140 feet in length.

* * * * *

MORE CANNED SALMON IN NEW BRITISH IMPORT QUOTAS CONCEDED TO JAPAN: New British import quotas conceded to Japan include additional canned salmon. The British have announced that provision is being made for additional trade over the next six months of about £150,000 (US\$420,000) each way between Japan and Great Britain. The new quotas conceded for imports from Japan include additional canned salmon covering more than half the £150,000.

The British Government stated on April 17 in reply to a question in the House of Commons on Anglo-Japanese trade talks that the midterm review of the arrangements made in October 1955 revealed that the agreement was working satisfactorily, reports a United States Embassy dispatch (April 17) from London.

* * * * *

SCOTLAND'S SEAWEED INDUSTRY: Scotland's long sea coast with villages often at the head of the bays offers a profitable harvest of seaweed. Just how profitable it is can be seen from the fact that a new industry based on the products (alginate) derived from seaweed has been built up in Scotland. The products of this new industry are worth US\$2.8 million a year. In 12 months more than 40,000 tons of seaweeds were harvested, reports the February 1956 South African Shipping News and Fishing Industry Review.

The seaweed industry existed to some extent before the last war, but emergency wartime needs of alginates forced a rapid expansion and since then research headed by the Government-sponsored Institute of Seaweed Research has found uses for alginates in food industries and cosmetics, in rubber, textiles, and dentistry.

About 10 million tons of seaweed have been located along Scotland's west coast that can be harvested at three-year intervals. Harvesting gives work to farmers who could not undertake full-time employment because of their own crops and cattle.

The seaweed is dried at drying stations dotted throughout the area and then processed at a number of small factories, often the only industry within many miles. As a result the British alginate industry, which ten years ago used only foreign seaweed now produces over a quarter of the total world production.

* * * * *

STERN TRAWL ADOPTED FOR NEW BOAT: Experiments by British inventors and trawling companies in the development of factory-type fishing trawlers have

proven the practical value of the stern trawl, now in use on the factoryship Fairtry. The system of bringing the trawl up through a stern chute was developed to overcome the difficulties encountered in using the conventional side trawl on a highsided ship such as the Fairtry. The Fairtry, launched in 1953, has been reported to have been uniformily successful in bringing back good catches.



A new Fishing and Research Com- Stern view of Fairty. Note chests for trawl net and unusual athwartship gallows.

pany has been formed to further the development of the stern trawland experiments are being carried out on the <u>Benvolio</u>, the
Hull trawler that has also been experimenting with an electronic mid-water trawl.
This firm has placed an order for a new 255-foot stern trawling vessel which will
be equipped with the new trawl.

In a summary of his impressions of the stern trawl and the advantage a distant-water vessel would have if equipped with one, one of the partners in the new Fishing and Research Company states: "The crew are under cover during the major part of the hauling operation and totally so during gutting and other processing work. Fewer men are needed on deck actually to guide the net aboard. Stern trawling is a more flexible system and with the new electronic mid-water trawl which has been developed, less damage is caused to the nets, together with bigger catches.

"In addition the ship gains more stability. It is therefore a better fishing platform and in heavy weather can continue on the fish since the vessel is headed into the wind with the trawl trailing over the stern.

"Side trawling for distant-water vessels is outmoded in the light of the new development. The future lies with the factory class of vessel where the whole catch is processed immediately. ..."

Redesigning the net gear was a corollary of the new trawling system. Among other improvements, the normal otter boards were replaced with "parotters." This type of otter board has curved surfaces which impart a far greater thrust to the mouth of the net without a resultant downward pull. Unlike the conventional otter boards they do not drag across the sea bed. The principal is the same as in the paravane designed for mine sweepers, according to the January 20 issue of $\underline{\text{The}}$ $\underline{\text{Fish-ing}}$ $\underline{\text{News}}$, a British trade paper.

* * * * *

TRAINING COURSES FOR FISHERMEN CONTINUED: Training courses for new recruits to the fishing industry have been organized at Hull, Grimsby, Lowestoft, Plymouth, and in Scotland. Additional courses to enable those already in the industry to improve their positions have also been organized At Grimsby, Hull, Fleetwood,

Lowestoft, Milford Haven, and in Scotland. The courses are under the direction of the local educational authorities with the Federal White Fish Authority donating maintenance grants and allowances, states a recent dispatch from the United States Embassy in London.

The rates of maintenance grants made by the White Fish Authority to those attending full-time training courses were raised in 1956 in accordance with increases granted recently by the Ministry of Labor for other industries. The White Fish Authority decided in 1955 to base its scales on those of the Ministry of Labor in order to encourage an extension of training in the white fish industry.

The new rates, effective January 2, 1956, range from 44s. (US\$6.16) for a 15-year old trainee to 90s.(US\$12.60) a week for those 20 years and older while living at home. The trainees living away from home are allowed between 30-60s. (US\$4.20-8.40) for the ages 15 to 20 and over plus a lodging allowance up to a maximum of 40s. (US\$5.60) a week. Married men or single men with dependents are allowed additional grants depending on the age of the trainee, age of the dependent, and the number of dependents.

* * * * *

TRAWLERMEN SAY SUBSIDIZEDICELAND TRAWLERS MAY HURT THEM: Price competition with Icelandic fishermen when the ban on their landings in England is lifted (because of the high subsidy paid by Iceland to their trawlers) was referred to in a statement issued by the British Trawlermen's Federation and published in the March 9 issue of The Fishing News.

The subsidy is estimated at more than US\$308 a fishing day, or about US\$95,200 a year for each vessel. It is pointed out that if this same rate was paid to British trawlers it would cost US\$25.2 million a year.

The statement continued: "Our British trawlers, which are not permitted to land in other foreign countries, even when they land in British ports are in the unhappy spot of competing with heavily-subsidized foreigners.

"Nevertheless we believe that a settlement can be worked out and we think we have so arranged the details of our proposals that they will be readily welcome in Iceland."

* * * * *

<u>WHALING BUOY WITH RADIO TRANSMITTER DEVELOPED</u>: An English electronics firm has designed a whaling buoy incorporating a radio transmitter, to enable whaling factoryships to recover and process whales killed by the catcher vessels. This type of buoy, although developed for the whaling expeditions, could be used for other fisheries.

The radio buoys (with individual call signals) are carried by each catcher, and once a whale is harpooned the buoy is secured to it by a 20-fathom nylon line attached to a barb. The buoy is switched on by means of an external control on the casing and left floating beside the whale. The equipment within the buoy ensures that the transmitter operates for two minutes in every ten, transmitting between 1.7 and 2.1 megacycles a call sign in Morse and a long continuous signal for direction-finding purposes. The call sign and direction-finding signal are repeated four times. These periods of transmission are broken after two minutes to ensure that the buoys will radiate in this way for 22 hours on one battery charge. It is usual at this point for the catcher to radio the factoryship that a buoy has been secured to a whale, and to give the approximate position and the call signal of the buoy.

The functioning of the transmitter mechanism is entirely automatic, being controlled by a time switch. This time switch is wound before the buoy enters the water and is capable of running on one winding for between 7 and 10 days. A clockwork motor drives a pair of cams, one of which switches on the filaments of the valves approximately half a minute before switching on the high-tension voltage. At the same time the coding mechanism commences turning, and contacts open and close as the specially-cut coding cam radiates the assigned call sign.

The transmitter portion of the equipment contains two valves and is crystal-controlled, the whole assembly being mounted on rubber supports to ensure that valves and components are protected from sudden shocks. A meter is fitted on the main top plate to facilitate tuning the transmitter. The transmitter power needs are supplied by an accumulator housed at the foot of the buoy in which position its weight adds to the stability of the buoy. A range of up to 150 miles has been obtained in the Antarctic due principally to the absence of interference on the 2-megacycle band in that region, an April 6 dispatch from the United States Embassy in London states.



Venezuela

TUNA LONG-LINER LANDS GOOD TRIP: The long-liner Bozo Maru, operated by a Japanese crew and owned by a Venezuelan, landed 100 metric tons of tuna at La Guaira about the middle of March. The catch was made in 15 fishing days north of the island of Curacao. In a dispatch dated March 21, the United States Embassy at Caracas stated that 40 tons had been sold to wholesalers at La Guaira at about US\$300 a ton.

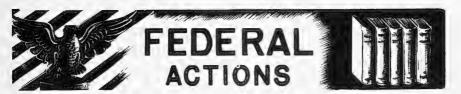
The Japanese captain reported that a total of 408 tons of tuna had been caught in 45 fishing days by the $\underline{\text{Bozo}}$ $\underline{\text{Maru}}$, since it began operations off Venezuela. The wholesalers announced that this fish would be placed on sale in Caracas fish markets at the price of US\$1,050 a metric ton. The usual varieties of fresh fish are retailing at 61-68 U. S. cents a pound. Thus the tuna consumers will be getting fresh fish at 48 U. S. cents a pound.



DO YOU KNOW:

It has been estimated that there are anywhere from 20,000 to 40,000 different species of fishes in the world. While the exact number will, of course, never be known, ichthyologists generally agree that there are more than 20,000 known species, with about 100 new species being described each year.

--<u>Sea Secrets</u>, The Marine Laboratory, University of Miami, Coral Gables, Fla.



Department of Agriculture

VOLUNTARY STANDARDS FOR FISH STICKS PROPOSED:

As the result of cooperative efforts by the fishing industry, the U. S. Department of the Interior, and the Department of Agriculture, quality standards



Trays of cooked fish sticks in Gloucester, Mass., plant ready for the packing table.

that have proved so valuable as a marketing aid for agricultural products will become available for fishery products.

The U.S. Department of Agriculture April 23, 1956, proposed issuance of United States Standards for grades of frozen fried fish sticks, the first to be formulated for this product.

Production of frozen fried fish sticks has increased rapidly since the product's appearance on the market in volume in 1953. Production in that year of approximately 7.5 million pounds increased to approximately 65 million pounds in 1955.

Funds made available by Public Law 466, "the Saltonstall-Kennedy Act," have been used to expedite the program of the Fish and Wildlife Service for the development of voluntary Federal standards. Frozen fried fish sticks were selected as the product of highest priority by the fishing industry. A committee of industry technologists, representative of fish stick producers and distributors, actively cooperated with the Service scientific staff in the studies of the product and of

the processing procedures required to insure the development of a realistic and practical standard.

Also now in process of development are proposed standards for fish blocks (the raw material from which fish sticks are prepared), and frozen raw breaded shrimp.

In order to fully utilize the existing facilities and personnel within the Federal Government, the U.S. Department of the Interior has joined with the U.S. Department of Agriculture to develop, establish, and implement the standardization program for fishery products. The U.S. Department of the Interior will conduct all research, conferences, and meetings required to develop or revise standards. The standards will then be transmitted to the U.S. Department of Agriculture with the recommendation that it promulgate them. When they become effective, the U.S. Department of Agriculture will offer an inspection and certification service on a fee basis upon request by any financially interested party. Such inspections would aid in quality controls and in facilitating the marketing of the product.

The proposed standard for frozen fried fish sticks applies to whole rectangular-shaped portions of fish meat, breaded, precooked, and frozen. It is recommended that the "largest dimension" (length) of the sticks be at least three times that of the "next largest dimension" (width), and that the average weight of the individual sticks be not less than $\frac{3}{4}$ ounce and not greater than $1\frac{1}{4}$ ounces. The grades proposed include "U. S. Grade A" and "U. S. Grade B." Quality below these grades would be classified as "Substandard,"

Technical requirements for ascertaining quality include the factors of: flavor

and odor; appearance as to size uniformity, color, and coating; defects; such character elements as ease of separation, wholeness, freedom from oiliness or crumbliness in the coating; tenderness and moistness of the meat, and the consistency and adherence of the coating on the heated product. \

The proposal does not define proper labeling nomenclature for this product. Frozen fried fish sticks when sold in interstate commerce are required to conform to the labeling regulations of

the Food and Drug Administration, U.S. Department of Health, Education and Welfare.

Interested persons have until June 26, 1956, in which to submit views or comments on the proposed standards for grades to the Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25. D. C.

The proposed standard for fish sticks as it appeared in the April 26, 1956 Federal Register follows:

FROZEN FRIED FISH STICKS

UNITED STATES STANDARDS FOR GRADES 1

NOTICE OF PROPOSED RULE MAKING

Notice is hereby given that the United States Department of Agriculture is considering the issuance of United States Standards for Grades of Frozen Fried Fish Sticks pursuant to the authority contained in the Agricultural Marketing Act of 1946 (60 Stat. 1087 et seq., as amended; 7 U.S.C. 1621 et seq.). These proposed grade standards are recommended by the Fish and Wildlife Service, U. S. Department of Interior, based on data developed by that agency. This proposal, if made effective, will be the first issue by the Department of grade standards for this product.

All persons who desire to submit written data, views or arguments for consideration in connection with the proposed standards should file the same with the Chief, Processed Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., not later than 60 days after publication hereof in the FEDERAL REGISTER.

The proposed standards are as follows:

PRODUCT DESCRIPTION, AND GRADES Sec.

52.3141 Product description 52.3142 Grades of frozen fried fish sticks.

VETCHTS AND DUMENSIONS 52.3143 Recommended weights and dimen-

PACTORS OF QUALITY

52.3144 Ascertaining the grade for frozen fried fish sticks. 52.3145 Ascertaining the score for the fac-

tors which are rated.

sions.

52.3146 Appearance. Defects

52.3148 Character.

LOT CERTIFICATION TOLERANCES

52.3149 Tolerances for certification of officially drawn samples.

SCORE SHEET

52.3150 Score sheet for frozen fried fish sticks.

AUTHORITY: §§ 52.3141 to 52.3150 issued under sec. 205, 60 Stat. 1090, as amended; 7 U.S.C. 1624.

¹ Compliance with these standards does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

PRODUCT DESCRIPTION AND GRADES

§ 52.3141 Product description. Frozen fried fish sticks are clean, wholesome, rectangularly-shaped portions of breaded, pre-cooked, and frozen fish flesh. The portions of fish flesh, com-posed primarily of large pieces, are coated with a suitable batter and breading: are cooked by frying in suitable oil or fat: and are frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product. Frozen fried fish sticks contain not less than 60 percent, by weight, of fish flesh. All sticks comprising an individual package are prepared from the flesh of only one species of fish.

§ 52,3142 Grades of frozen fried fish sticks. (a) "U.S. Grade A" is the quality of frozen fried fish sticks that possess a good flavor and odor, that possess a good appearance, that are practically free from defects, that possess a good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 85 points: Provided, That the frozen fried fish sticks may possess a reasonably good appearance and a reasonably good character if the total score is not less than 85 points.

(b) "U. S. Grade B" is the quality of

frozen fried fish sticks that possess a reasonably good flavor and odor, that possess a reasonably good appearance, that are reasonably free from defects, that possess a reasonably good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 70 points: Provided, That the frozen fried fish sticks may fail to possess a reasonably good appearance and fail to possess a rea-sonably good character if the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen fried fish sticks that fail to meet the requirements of U.S. Grade B.

WEIGHTS AND DIMENSIONS

§ 52.3143 Recommended weights and dimensions. The recommended weights and dimensions of frozen fried fish sticks are not incorporated in the grades of the finished product since weights and dimensions, as such, are not factors of quality for the purposes of these grades. It is recommended that the largest dimension of a fish stick be at least three times that of the next largest dimension

and that the average weight of the individual sticks be not less than 34 ounce and not greater than 11/4 ounces.

FACTORS OF QUALITY

§ 52.3144 Ascertaining the grade—
(a) General. In addition to considering other requirements outlined in the standards, the following quality factors are evaluated in ascertaining the grade of the product:

(1) Factor not rated by score points.

(i) Flavor and odor.

(2) Factors rated by score points. The relative importance of each factor which is rated is expressed numerically on the scale of 100. The maximum number of points that may be given such factors are:

Factors: Points Appearance _____ 85 40 Defects Character _____ 25

(b) The grade of frozen fried fish sticks is ascertained by observing the product in the frozen state and after it has been heated in a suitable manner.

(c) Percent of fish flesh. "Percent of fish flesh" means the average percent, by weight, of fish flesh in an individual

(d) Good Flavor and odor. "Good flavor and odor" means that the product has the good flavor and odor of properly prepared breaded fish sticks. The flesh portion has the good flavor and odor of properly prepared fish of the particular species. The coating has the good flavor and odor obtained when all components have been properly prepared, used, and maintained. The product is free from rancidity, bitterness, and staleness, from bacterial spoilage flavors and odors, and from off-flavors and off-odors of any kind.

(e) Reasonably good flavor and odor.
"Reasonably good flavor and odor." means that the product may be somewhat lacking in good flavor and odor, but is free from rancidity and from objectionable bacterial spoilage flavor, and from off-flavors and off-odors of any

(f) Heating in a suitable manner.
"Heating in a suitable manner" means heating in accordance with the recommendations accompanying the product. However, if specific instructions are lacking the product should be heated as follows:

(1) Place the product while still in | the frozen state on a flat or shallow pan of sufficient size that at least 10 ounces of the product can be spread evenly on the pan with no portion of a stick closer than 1/4 inch to another or to the edge of the pan.

(2) Place the pan and frozen contents in a properly ventilated oven pre-heated to 400 degrees Fahrenheit and remove when the product is thoroughly heated.

§ 52.3145 Ascertaining the score for the factors which are rated. The es-sential variations within each factor which is rated are so described that the value may be ascertained for each factor and expressed numerically. The numerical range within each factor which is rated is inclusive. (For example, "21 to 25 points" means 21, 22, 23, 24, or 25 points).

§ 52.3146 Appearance—(a) General. The factor of appearance refers to the uniformity of size and shape of the frozen sticks, the color of the heated sticks, and the continuity of the coating of the product after heating.

(b) (A) classification. Frozen fried fish sticks that possess a good appearance may be given a score of 30 to 35 points. "Good appearance" means that the sticks are practically uniform in size and shape; that the product after heating possesses a practically uniform light brown to golden brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not more than slightly affected by cracking

or slipping.
(c) (B) classification. Frozen fried fish sticks that possess a reasonably good appearance may be given a score of 25 to 29 points. "Reasonably good appearance" means that the sticks are reasonably uniform in size and shape; that the product after heating possesses a reasonably uniform light brown to golden-brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not materially affected by cracking or slipping.

(SStd.) classification. fried fish sticks which fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 24 points, and shall not be graded above U. S. Grade B regardless of the total score of the product (this is a partial

limiting rule).

§ 52.3147 Dejects-(a) General. The factor of defects refers to the degree of freedom from bones, broken sticks, damaged sticks and from blemishes

(1) Bones. "Bones" means any bones that can be separated from the product. can be identified, and are of such character as to be potentially harmful.

(2) Broken stick. "Broken stick" means a fish stick which is separated in two or more parts or is strained apart to the extent that it cannot be readily handled as one stick.

(3) Damaged stick. "Damaged stick" means a fish stick which has been

extent that its appearance is materially

(4) Blemished. "Blemished" means the presence (in or on the fish flesh) of blood spots, bruises, skin, protein curd spots, and objectionable dark layer fat, and (on or in the coating) of burned material, dark carbon specks, and other harmless extraneous material.

(5) Seriously blemished. blemished" means blemished to the extent that the appearance is seriously

affected.

(b) (A) classification. Frozen fried fish sticks that are practically free from defects may be given a score of 34 to 40 "Practically free from defects" points means that:

(1) None of the sticks are broken: (2) The sticks may be blemished to

only a minor degree; and

(3) Not more than a total of 20 percent, by count, of the sticks may be damaged or contain bones: Provided, That bones may be present in not more than 10 percent, by count, of all the sticks.

(c) (B) classification. Frozen fried fish sticks that are reasonably free from defects may be given a score of 28 to 33 points. Frozen fried fish sticks that fall into this classification may not be graded above U. S. Grade B regardless of the total score for the product (this is a limiting rule). "Reasonably free from defects" means that not more than a total of 30 percent, by count, of the sticks may be defective because of bones, or are damaged sticks, broken sticks, or seri-ously blemished sticks: Provided, That (1) Not more than 10 percent, by

count, may be broken sticks; (2) Not more than 30 percent, by count, may be damaged sticks:

(3) Not more than 20 percent, by count, of the sticks may contain bones; and

(4) Not more than 10 percent, by count, of the sticks may be seriously blemished.

(d) (SStd.) classification. Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 27 points, and may not be graded above substandard regardless of the total score for the product (this is a limiting

§ 52.3148 Character - (a) General. The factor of character refers to the presence or absence of free oil in the package and its effect on the condition of the package: the ease of separating the frozen sticks without damaging the coating or breaking the sticks; the tendency of the sticks to remain whole and unbroken when they are heated, handled, and served in the normal manner; the degree of freedom of the breading from either an oiliness or crumbliness; the tenderness and moistness of the flesh; the consistency of the breading in the heated product; and the adherence of the coating of the heated product.

(b) (A) classification. Frozen fried fish sticks that possess a good character may be given a score of 21 to 25 points. "Good character" means that oil from the product does not more than slightly

crushed or otherwise mutilated to the | damage the package; that there may be present not more than a very small amount of loose breading in the package; that the sticks may be separated easily; that the sticks are not more than very slightly damaged by the normal handling incident to heating and serving; that no excess oil remains on the cooking utensil; that the breading is not more than slightly oily; that the flesh after heating has a good texture which is firm, tender and moist, characteristic of properly fried fish sticks for the species used; and that after heating the coating has a good crisp, tender texture not more than slightly affected by blistering or wrinkling.

(c) (B) classification. Frozen fried fish sticks that possess a reasonably good character may be given a score of 17 to 20 points. "Reasonably good character" means that oil from the product does not materially damage the package; that there may be present not more than a reasonable amount of loose breading in the package; that the sticks may be separated with only moderate damage to the coating: that the sticks are not more than moderately damaged by the normal handling incident to heating and serving; that the breading is not more than moderately oily; that the flesh after heating has a reasonably good texture which is not more than moderately tough, stringy, crumbly, mushy or spongy; and that after heating the coating has a reasonably good texture which may be not more than moderately pasty, mushy, tough, or crumbly and is not materially affected by blistering or wrinkling.

(d) (SStd.) classification. Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 16 points and shall not be graded above U.S. Grade B regardless of the total score for the product (this is a partial limiting mile)

LOT CERTIFICATION TOLERANCES

§ 52.3149 Tolerances for certification of officially drawn samples. (a) The grade of a specific lot from which samples have been officially drawn may be certified on the basis of such samples: Provided. That (1) all packages contain one species of fish; (2) all packages meet applicable provisions of the Federal Food, Drug, and Cosmetic Act in effect at the time of the aforesaid certification: And provided further. That, with respect to those factors which are rated by score points, such grade will be determined by averaging the total scores, if:

(i) Not more than one-sixth of the packages fail to meet the grade indicated by the average of such total scores;

(ii) None of the packages fall more than one grade below the grade indicated by the average of such total scores; and

(iii) The average score of all packages for any factor subject to a limiting rule is within the score range of that factor for the grade indicated by the average of the total scores of the packages comprising the sample.

SCORE SHEET

§ 52.3150 Score sheet for frozen fried fish sticks.

Label. Species of fish. Container mark or identificat Size of lot. Number of samples. Net weight (oz.) Number of sticks per containe	on.		
Factors		Score points	
Appearance	35	(A) 30-35 (B) 25-29 (SStd.) 10-24	
Defects	40	(SStd.) 2 28-33 (SStd.) 2 0-27	
Character	25	(A) 21-25 (B) 17-20 (SStd.) 10-16	
	100	1	ì

¹ Indicates partial limiting rule. ² Indicates limiting rule.

Dated: April 23, 1956.

ROY W. LENNARTSON. [SEAL] Deputy Administrator. Marketing Services.



§ 102.8 Registration of boats and quired herein shall be permitted to en-! gear. (a) Each year, 30 days prior to the opening of any fishing season in any regulatory area as defined herein, the units of gear and all boats intended to be used in fishing in such area shall be registered for the regulatory area of proposed operation and for no other. Such registration shall be made with the local representative of the Fish and Wildlife Service. No person shall be permitted to register any gear or boat so as to permit his fishing for salmon, except by trolling, in more than one regulatory area during the calendar year. Such registration shall include the furnishing of information on the size, type, crew, gear, and identity of boats, the name and address of any and all fishermen who will fish with such gear or boat, and the fishery (salmon, crab, etc.) in which such gear, boat or fisherman intends to operate. When registration plates are furnished for boats, such plates shall be displayed in a prominent place on the port side. No gear or boat which has not been registered as re- change.

gage in any fishery.

(b) No gear or boat fishing for salmon, but not including trolling lines and boats fishing with such excepted gear, which has been registered for fishing in a designated regulatory area, may thereafter be used for fishing in any other area, nor may any person or persons other than the person or persons designated in the original registry fish such boat or gear, except that substitutions in crew members or gear operators may be made with the approval of the local representative where such substitutions are made for the purpose of replacing fishermen who become ill or are otherwise removed from the fishery.

(c) Salmon trolling gear and boats and all other gear and boats used in fishing for species other than salmon may change their operations from one regulatory area to another and from such other fishery to salmon fishing, but only after such proposed change has been reported to a local representative of the Fish and Wildlife Service in advance of such

Department of the Interior

FISH AND WILDLIFE SERVICE

REGULATIONS FOR SALMON FISHING BOATS AND GEAR:

Due to the continued increase of the movement of mobile salmon boats from

area to area in Alaska, it has been determined that such movement must be curtailed in the interests of sound conservation. An amendment to section 102.8



of the Alaska Commercial Fisheries Regulation was announced on April 4 by Acting Secretary of the Interior Clarence A. David. The amendment to section 102.8, effective immediately, as published in the Federal Register follows:

> (d) Registration of boats and gear shall not be required of any boat engaging solely in the halibut fishery.

(e) Registrations subsequent to the specified time of registration and changes in area of fishing operation may be permitted to avoid unusual hardships and for other good cause provided such registrations and changes are consistent with needs of fishery conservation in the affected area. For the purpose of this section only, the following regulatory areas or combinations of regulatory areas are considered to be single regulatory areas:

(1) Bristol Bay area

- (2) Aleutian Islands-Alaska Peninsula-Chignik areas.
 - (3) Kodiak area.
- (4) Cook Inlet-Resurrection Bay areas
- (5) Prince William Sound-Copper River-Bering River-Yakataga areas.
 - (6) Yakutat area. (7) Southeastern Alaska area.
- (f) For the 1956 season only, registration for the Copper River area shall not be made less than 15 days prior to the opening of the fishing season.



Eighty-Fourth Congress (Second Session)

Public bills and resolutions that directly or indirectly affect the fisheries



and allied industries are listed-they are shown when introduced; then from month to month the more pertinent reports, hearings, or chamber actions on the bills listed are

indicated; and bills, if passed, are then shown again when signed by the President.

COMMERCIAL FISHERIES EDUCATIONAL PROGRAM: 5,2379 (Payme) introduced in the First Session of this Congress, a bill to promote the fishing industry in the United States and its Territories by providing for the training of needed personnel for such industry. Reported to the Senate by the Committee on Interstate and Foreign Commerce on May 17 (S, Rept. 2014).

Senate Report No. 2014, Providing for the Training of Personnel for the Fishing Industry (May 17, 84th Congress, 2nd Session), to accompany S. 2379, 10 pp., printed, Explains the amendments, gives the background and need for the legislation, presents the Department of the Interior's Report, explains the allocation of funds under the bill, and indicates the changes in the Vocational Education Act of 1446.

Also H. R. 10433 (McCormack) introduced into the House April II, 1956; a bill to promote the fishing industry in the United States and its territories by providing for the training of needed personnel for such industry; to the House Committee on Merchant Marine and Fisheries. Proposes a program of federal grants to colleges and universities for the training of technicians and other professional personnel in the field of commercial fishing. It authorizes an appropriation of \$550,000 annually for distribution by the Secretary of the Interior to colleges and universities. Also amends the Vocational Education Act of 1946 to authorize the appropriation of \$375,000 annually for vocational education in the fishing trades. Same as \$5, 2379.

COMMERCIAL FISHERIES NATIONAL POLICY AND FISH-ERIES COMMISSION: S. 3275 (amended) was reported favorably with amendments to the Senate on May 17 (S. Rept. 2017) by the Senate Committee on Interstate and Foreign Commerce. Provides for the establishment of the independent National Fisheries Commission in the Department of Interior, composed of five members, the chairman to be the Assistant Secretary of Interior for Fisheries. Not more than three members can be of the same political party and they will be appointed by the President and must be confirmed by the Senate. The President will designate the chairman. At least three of the commissioners shall be experienced in the fishing industry, and two shall be from the area west of the Mississippi River, and two from the area east of it. While the Commission is placed in the Interior Department, it will operate independently as to all policy matters. The measure also provides that the Fish and Wildlife Service will become the Wildlife Service of the Department and all funds and

functions of the fishery section of the present service will be transferred to the new commission.

The Commission is charged with promoting the welfare of the fishing industry, keeping a continuing investigation going of the flow to market of fish and fishery products, and also follow closely the importation of foreign fish and its effect upon the domestic market.

The bill creates in the Department a fisheries division which is charged with the administration of policies developed by the Commission relating to fisheries. This would include development, advancement, management, conservation, and protection of the Nation's fisheries. The Chairman of the Commission, in his position as Assistant Secretary, will head the division.

The Fisheries Commission would be required to be represented at all conferences with foreign governments in which the State Department participates and the Secretary of State is directed to name one member of the Fisheries Commission as a member of all United States Delegations taking part in such international fisheries conferences,

The Commission would be required to cooperate with the States in promotion of their fisheries programs and with other governmental, private nonprofit, and other organizations and agencies in any problems arising out of administering the Act, The Commission also must be represented in any tariff negotiations affecting the fish industry,

The bill directs that the Fisheries Division of the Interior Department shall be the administrative organization and the Fisheries Commission the policy-making body.

The Commission is required to make periodical reports to Congress and recommendations for legislation to aid the fishing industry. It is prohibited from interfering with the fishery programs of any state, interstate compacts, and international commissions established by treaty. It would have complete jurisdiction over all fishery problems, whales, sea lions, and hair seals.

Senate Report No. 2017, Fisheries Act of 1956 (May 17, 1956, 84th Congress, 2nd Session), to accompany S. 3275, 7 pp., printed, Discusses field investigations, hearings conducted by the Committee, drafting of fisheries bill S, 3275, revision of S, 3275, and the reported bill section by section. Also includes a list of organizations and individuals other than Senators who have advocated and endorsed the amended substitute of S, 3275.

Amended substituted S. 2275 (Magnuson, Saltonstall, Kennedy, Green, Bush, Flanders, Butler, Beall, Smathers, Johnston of S. C., Sparkman, Hill, Eastland, Stennis, Humphrey, Murray, Kuchel, Jackson, George, Knowland, Schoeppel, Chavez, Duff, Payne, Bible, Monroney, Neuberger, Potter, Kefauver, Lehman, Malone, Pastore, Purtell, Ives, and Mansfield, reported to the Senate May 17. The bill as printed would establish a sound and comprehensive national policy with respect to the development, conservation for preservation, management and use of fisheries resources; create and prescribe the functions of the United States Fisheries Commission; and for other purposes; referred to the Senate Committee on Interstate and Foreign Commerce.

H. R. 10746 (King of California) introduced in the House April 23 proposes to establish a sound and comprehensive national policy with respect to the fisheries; to create and prescribe the functions of the United States Fisheries Commission: to strengthen the fisheries segment of the national

economy; and for other purposes; to the Committee on Merchant Marine and Fisheries. Establishes under the Department of the Interior a five-member United States Fisheries Commission with broad powers for fisheries,

Also introduced April 24: H. R. 10755 (Bates), H. R. 10760 (Colmer), H. R. 10770 (Miller of Md.); introduced April 25: H. R. 10784 (Bennett of Fla.), H. R. 10792 (Fascell), H. R. 10793 (Kilgore), H. R. 10797 (Sikes), H. R. 10810 (Rogers of Fla.), H. R. 10813 (Thompson of La.); April 26: H. R. 10848 (Wilson of Calif.); April 27: H. R. 10874 (Cramer), H. R. 10888 (Thompson); April 30: H. R. 10907 (Maguson), H. R. 10910 (Pelly); May 2: H. R. 10953 (Herlong); May 3: H. R. 10995 (Donohue); May 8: H. R. 1089 (Willis); all referred to the House Committee on Merchant Marine and Fisheries, and all similar to H. R. 10746. These bills are substitutes for H. R. 9552 and the original 8, 3275, and other bills on this subject introduced earlier this session in the House.

FISHERIES DIVISION IN DEPARTMENT OF INTERIOR; S. 3694 (Kennedy, Saltonstall, Mrs. Smith of Maine, & Payne), introduced in the Senate April 23, proposes to reorganize the Department of the Interior by establishing a Fisheries Division in such Department under an additional Assistant Secretary of the Interior; referred to the Senate Committee on Government Operations. This bill would establish within the Interior Department a Fisheries Division, with the functions under the direction and supervision of the Secretary of the Interior by an additional Assistant Secretary of the Interior appointed by the President and confirmed by the Senate. All functions, powers, duties, and authority of the Fish and Wildlife Service related primarily to fish, fisheries, and related matters would be transferred to the Fisheries Division. The present Fish and Wildlife Service would hereafter be known as the Wildlife Service. Also, the bill would authorize the Secretary of the Interior to appoint an advisory committee of the American fisheries industry to assist him in formulating national fisheries policy, with the committee composed of not more than 11 members to nearly as possible represent all segments of the industry.

Also H. R. 11185 (McIntire) introduced in the House May 14, a bill to reorganize the Department of the Interior by establishing a Commercial Fisheries Division under an additional Assistant Secretary of the Interior to exercise all functions having to do with commercial fisheries, now carried on by branches of Fish and Wildlife Service of such Department: to the Committee on Merchant Marine and Fisheries.

FISH HATCHERIES: S. 3831 (Laird) introduced in the Senate May 10, 1956, a bill to provide for a fish hatchery in the State of West Virginia; May 9: S. 3899 (Carlson), a bill to provide for the establishment of a new fish hatchery at Cedar Bluff Reservoir; both to the Committee on Interstate and Foreign Commerce.

Introduced in the House April 30, H. R. 10906 (Mrs. Kee), a bill to provide for a fish hatchery in West Virginia; May 3; H. R. 11012 (Smith of Kansas), a bill to provide for the establishment of a new fish hatchery on Cedar Bluff Reservoir, Trego County, Kans.; both to the Committee on Merchant Marine and Fisheries.

Reported to the House favorably by the Committee on Merchant Marine and Fisheries on May 2, H, R, 8810 (amended), authorizing the Secretary of the Interior to construct, equip, maintain, and operate a new fish hatchery in the vicinity of Miles City, Mont. (H. Rept. 2103); and H. R. 9822 (amended), to provide for the establishment of a trout hatchery on the Davidson River in the Pisgah National Forest in North Carolina (H. Rept. 2097).

House passed with amendments on May 7, H. R. 8810 and H. R. 9822, authorizing the Secretary of the Interior to construct, maintain and operate new fish hatcheries at Miles City, Mont., and Pisgah National Forest in North Carolina.

H. R. 8810, to provide for the establishment of a new fish hatchery at Miles City, Mont., reported to the Senate on May 14 by the Senate Committee on Interstate and Foreign Commerce (S. Rept. 1969).

GENERAL AGREEMENT ON TARIFFS AND TRADE: H. Res. 459 (Bailey) and H. Res. 460 (Hale) introduced in the House April 10, 1956; a resolution authorizing the Committee on Ways and Means to investigate and study the General Agreement on Tariffs and Trade; to the Committee on Rules,

GREAT LAKES FISHERIES CONVENTION: The Committee on Interstate and Foreign Commerce on April 25 reported favorably to the Senate S, 3524, to give effect to the Convention on Great Lakes Fisheries signed at Washington September 10, 1954, with amendments (S, Rept. 1858).

Senate Report No. 1858, Great Lakes Fishery Act of 1956 (April 25, 1956, 84th Congress 2nd Session) to accompany S. 3524, 3 pp., printed, Discusses the purpose of the bill and the amendments,

Passed by the Senate on April 30 with amendment and cleared for the House S. 3524, to give effect to the Convention on Great Lakes Fisheries,

S, 3524, to give affect to the convention on Great Lakes fisheries, reported to the House on May 14 by the House Committee on Merchant Marine and Fisheries (H. Rept. 2154).

NTERIOR APPROPRIATIONS: The Senate Committee on Appropriations in executive sessions on April 17, 1956, ordered favorably reported with amendments H. R. 9390, fiscal 1957 appropriations for Interior Department and related agencies (including the Fish and Wildlife Service). The bill was reported to the Senate by the Committee April 18 & Rept. 1761).

Senate Report No. 1761, Interior Department and Related Agencies Appropriation Bill, 1957 (April 17, 1956, 84th Congress, 2nd Session), to accompany H. R. 9390, 32 pp., printed. Contains a summary of the bill by agency and a comparative statement of the appropriations for 1956 and the estimates for 1957.

Fish and Wildlife Service increases included, among others, under "management of resources," \$100,000 for the fish hatchery program; under "investigation of resources," \$40,000 for Great Lakes fisheries research,

Senate passed with amendments on April 23, H. R. 9390 fiscal 1957 appropriations for Interior Department and related agencies (including the Fish and Wildlife Service), after adopting amendments, The bill was scheduled for conference with the House,

ORGANIZATION FOR TRADE COOPERATION (OTC): The House Ways and Means Committee gave its approval on March 26 to the OTC bill, H. R. 5550 (Cooper), introduced April 14, 1955, with certain amendments intended to define and limit United States activities under the OTC, After the report of the Ways and Means Committee is filed, it will be in order for the Committee to request a rule providing for House consideration of the OTC bill.

The Committee on Ways and Means filed in the House a report on "The Agreement on Organization for Trade Cooperation" (H. Rept. 2007).

PROTECTION OF WALRUSES: S. 3778 (Watkins) introduced into the Senate May 7, 1956; a bill to amend the act for the protection of Walruses; to the Senate Committee on Interior and Insular Affairs.

Also H. R. 10412 (Bartlett) introduced into the House April 11, 1956; to the House Committee on Interior and Insular Affairs; similar to \underline{s} . 3778.

Both bills would amend the Walrus Protection Act of August 18, 1941, to permit the taking of one bull walrus per year by a licensed nonnative hunter provided the hunter is accompanied by a native guide and the meat is given to the natives. Authorizes the Secretary of the Interior to prohibit the taking of walruses by nonnatives whenever he determines the food supply of the natives is endangered.

H. R. 10412, to amend the act for the protection of walruses; reported favorably on May 9 by the Subcommittee to the House Committee on Interior and Insular Affairs.

SHELLFISH RESEARCH LABORATORY: S, 3827 (Butler) introduced in the Senate May 9, 1956; a bill to authorize the construction of a shellfish research laboratory and experiment station in the Chesapeake Bay area; to the Senate Committee on Interstate and Foreign Commerce,

Also H. R. 11186 (Miller of Md.) introduced in the House May 14; to the House Committee on Merchant Marine and Fisheries. Similar to §. 3827.

WATER POLLUTION: Subcommittee on Rivers and Harbors reported favorably to the House Committee on Public Works H. R. 9540 (amended) to extend and strengthen the Water Pollution Control Act.

 \underline{H}_{\bullet} , \underline{R}_{\bullet} , 9540 (Amended), ordered favorably reported to House on \overline{May} 17, by the Committee on Public Works,

FISHERIES LEGISLATION (Hearings before the Senate Committee on Interstate and Foreign Commerce, Eighty-Fourth Congress, Second Session, on S. 2379, a bill to promote the fishing industry in the United States and its territories by providing for the training of needed personnel for such industry; S. 3275, a bill to establish a sound and comprehensive national policy with respect to the development, conservation for preservation, management, and use of fisheries resources, to create and prescribe the functions of the United States Fisheries Commission, and for other purposes: S. 3339, a bill to provide for the stabilization of the domestic fisheries industry in the United States through the creation of a fisheries stabilization corporation, to bring about a better balanced flow of fish and shellfish and the products thereof in interstate and foreign commerce, and for other purposes; March 19, 20, 21, 22, 23, and 26, 1956), 304 pp., printed. Presents the statements of the various witnesses as well as written statements submitted and letters, telegrams, and memoranda received by the Committee regarding the bills indicated; the reports from Agriculture, Commerce, Interior, and State departments, and the General Accounting Office; a resolution from "Farmers of the Sea" Fishing Committee; and newspaper and magazine articles and press releases on fisheries legislation,

PACIFIC COAST AND ALASKA FISHERIES: (Hearings before the Senate Committee on Interstate and Foreign Commerce, Eighty-Fourth Congress, Second Session, pursuant to S. Res. 13, a resolution to investigate certain problems relating to interstate and foreign commerce, October 10, 11, 41, 51, 17, 18, 19, and 31, November 2 and 3, and December 5, 1955), 659 pp., printed. Presents oral statements of witnesses, written statements, letters, articles, documents, etc., and Senate Interstate and Foreign Commerce Committee staff reports dated July 1 and 6, 1955.



Editorial Assistant -- Ruth V. Keefe

Illustrator -- Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Helen Joswick

* * * * *

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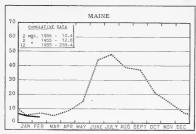
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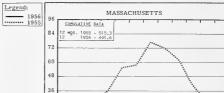


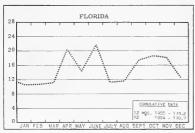


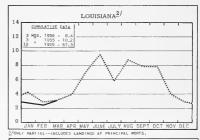
CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

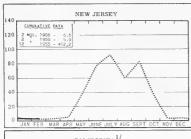


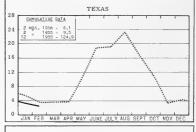


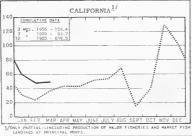




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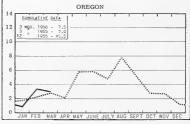
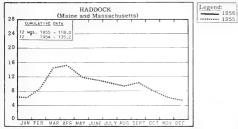


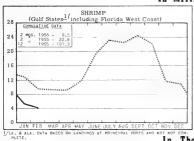
CHART 2 - LANDINGS for SELECTED FISHERIES

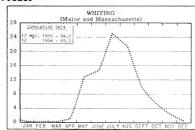




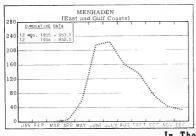


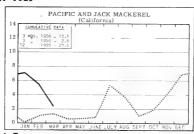
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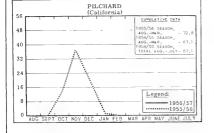


In Thousands of Tons





In Thousands of Tons



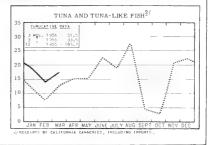
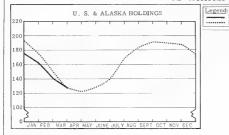
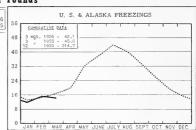
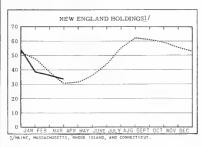


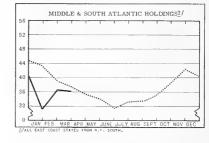
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

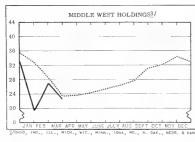


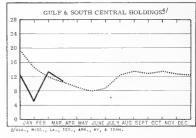


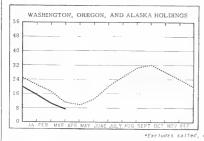


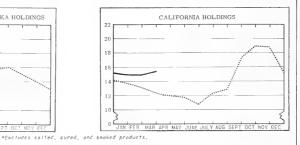


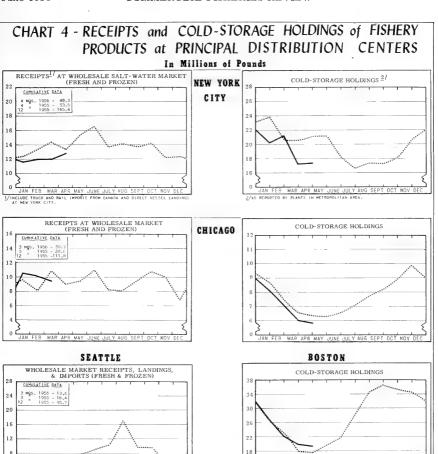






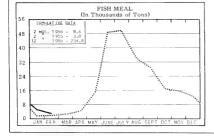








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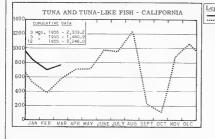


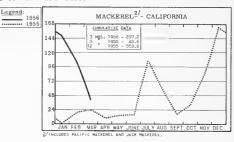
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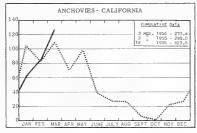


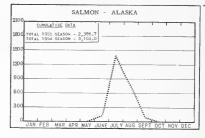
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

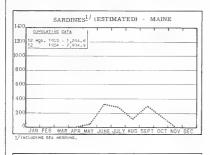
In Thousands of Standard Cases



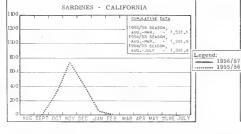








STANDARD CASES						
Variety	No. Cans	Can Designation	Net Wgt.			
SARDINES	100	1 drawn	$3\frac{1}{4}$ oz.			
SHRIMP	48		5 oz.			
TUNA	48	No. ½ tuna	6 & 7 oz.			
PILCHARDS	48	No. 1 oval	15 oz.			
SALMON	48	1-pound tall	16 oz.			
ANCHOVIES	48	1/2 lb.	8 oz.			



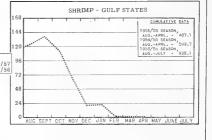
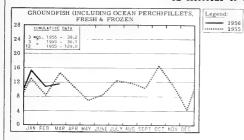
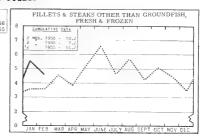
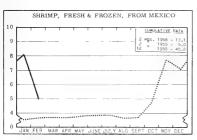


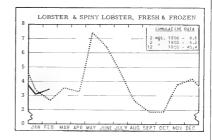
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

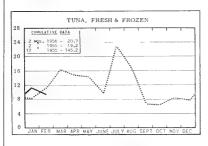
In Millions of Pounds

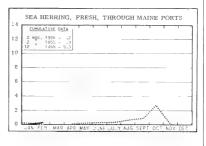


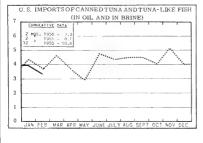


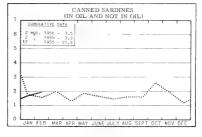














FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA.
- FISHERY LEAFLETS.

SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRO-DUCERS OF FISHERY PRODUCTS AND BYPRODUCTS. SSR. - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES

(LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1282 - Massachusetts Landings, December 1955, 5 pp.

CFS-1286 - Canned Fish & Byproducts, 1955 Annual Summary, 22 pp.

CFS-1287 - Packaged Fish, 1955 Annual Summary, 3 pp.

CFS-1290 - Rhode Island Landings, January 1956, 3 pp.

CFS-1292 - Fish Meal and Oil, February 1956, 2 pp.

CFS-1295 - Georgia Landings, January 1956, 2 pp. CFS-1296 - California Landings, November 1955, 4 pp.

CFS-1297 - New Jersey Landings, 1955 Annual Summary, 4 pp.

CFS-1300 - Alabama Landings, January 1956, 2 pp.

CFS-1305 - Georgia Landings, February 1956, 2 pp.

CFS-1311 - Shrimp Landings, February 1956, 4 pp.

FL - 434 - Facts About Red Tide, 2 pp., illus., processed, March 1956. Red Tide is the popular name for the colored-water and mass fish kills that have occurred off the Gulf coasts of Florida, Texas, and Mexico, as a result of overgrowth of a microscopic marine organism known as Gymnodinium brevis. This leaflet describes Red Tide and answers questions regarding this phenomenon.

Wholesale Dealers in Fishery Products (Revised): SL - 4 - Rhode Island, 1956, 2 pp.

36 - Iowa, 1955 (Mississippi River and Tributaries Area), 2 pp.

SSR-Fish. No. 165 - Food Habits of Georges Bank Haddock, by Roland L. Wigley, 29 pp., illus., processed, January 1956, This report presents the results of the first year's study of haddock food habits. The author states, that "The haddock's diet consisted principally of sedentary

or slow moving invertebrate animals; benthic and epi-benthic forms predominated. Small organisms were especially common in the food, presumably because the haddock's rather small mouth precludes taking large items. The percentage volume of each major food group in the diet was as follows: Crustacea - 33.1 percent; Mollusca - 17.5 percent; Echinodermata - 14.6 percent; Annelida - 9.9 percent; and Pisces -1.9 percent. Canadian biologists have reported that haddock on the offshore Nova Scotian banks fed predominately on fish. On Georges Bank crustaceans were found to be the primary food; fish constituted less than 2 percent of the food volume. Other notable differences were disclosed in the dietary composition of specimens collected from various parts of Georges Bank itself."

Sep. No. 436 - Insurance of Fishing Vessels: Some Current Problems.

Sep. No. 437 - Research in Service Laboratories (May 1956): Contains these short articles-"Jacketed-Principle Cold-Storage Room;" "Use of Fish Oils for Ore Flotation;" "Frozen Breaded Shrimp Federal Specification;" "Cod-Liver Oil Concentrate Has Unique Use."

Annual Report of the Director Fish and Wildlife

Service to the Secretary of the Interior, Fiscal
Year Ended June 30, 1955 (Reprinted from the Annual Report of the Secretary of the Interior), 33 pp., printed. Summarizes the various activities of the Service. Specifically discussed are: utilization of the commercial fishery resources (describes the activities of the Branch of Commercial Fisheries); management of the Alaska commercial fisheries; Pribilof Islands fur-seal industry; maintenance of inland waters; research in fishery biology (coastal, inland, marine, and shellfish fisheries); Federal aid to states for the restoration of fish and wildlife; river basin development and wildlife needs; international cooperation in conservation (international technical cooperation and international conservation agreements); and other activities.

One of the problems which came in for attention during the period of the report and which will have more attention in the future covered efforts to control the sea lampreys which are ruining commercial fishing in the Great Lakes.

Biological research covered a wide field of activities in many parts of the world. Recently-developed methods of predicting shad runs in the Hudson and Connecticut Rivers proved successful; limited studies by the Service and coordination of striped bass research conducted by the States under the Federal aid program continued; encouraging results were obtained from experimental fertilization of Bare Lake on Kodiak Island to increase red salmon production; electrical devices to guide salmon over dams were further developed; numerous shell-fish problems were given attention; a fleet of five vessels covered thousands of square miles of Pacific waters in a study of distribution, abundance and identity of salmon stocks; bacterial diseases of fishes, problems relative to Atlantic herring, yellowtail flounder, whiting, sea scallops and gulf shrimp and a number of other matters relative to the culture and habit of fish came in for field and laboratory scrutiny.

Exploratory fishing operations were continued in the Atlantic and Pacific Oceans and in the Gulf of Mexico. Discoveries of long-range importance to the tuna fishery were made in the central Pacific and in the Gulf of Mexico. New fishing areas for ocean perch, shrimp, and albacore were found.

Funds available from the Saltonstall-Kennedy Act permitted added emphasis to fishery research and the development of new marketing outlets for fishery products.

Special marketing campaigns were conducted to move surplus stocks of small haddock filets and canned tuna. There was considerable interest on the part of the fishing industry in voluntary Federal standards for grade and conditions of fishery products. Certain standards had been developed during the previous year and others are being developed.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

- (Seattle) Monthly Summary Fishery Products, March 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers.
- (Chicago) February 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U.S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.
- (New York) Monthly Summary January 1956 Receipts of Fishery Products at the New York City Wholesale Salt-Water Fish Market, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces for the month indicated.
- Monthly Summary of Fishery Products Production
 in Selected Areas of Virginia, North Carolina,
 and Maryland, March 1956, 4 pp. (Market News
 Service, U. S. Fish and Wildlife Service, 18
 S. King St., Hampton, Va.)
- Receipts of Fresh and Frozen Fishery Products at Chicago 1954, by G. A. Albano, 35 pp., processed, February 1956. (Available free from the Market News Service, U. S. Fish and Wild-

life Service, 565 West Washington St., Chicago 6, Ill.) This report presents an analysis of the marketing trends for fresh and frozen fishery products and statistical tables on the receipts of fresh and frozen fish and shellfish at Chicago during 1954. Statistics on arrivals of fishery products at Chicago are presented by species and by states and provinces of origin; states and provinces by species; species by months; states and provinces by months; totals by species; and totals by states and provinces. Receipts are tabulated by methods of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled on the Chicago market. In the analysis of the marketing trends for fresh and frozen fishery products at Chicago, the author discusses the sources of the receipts, methods of transportation, months of greatest receipts, receipts by species and varieties, lake trout and whitefish receipts, U. S. Great Lakes fishery production, U. S. imports of fresh and frozen fish from Canada, U. S. imports of frozen fillets, and cold-storage inventories. Also included is a table giving the names, classifications, and approximate weights of certain fishery products sold in the Chicago wholesale market.

Receipts of Fishery Products at New York City, 1954, by Henry M. Bearse, 19 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 155 John Street, New York 38, N. Y.) Contains an analysis of fishery products receipts for 1954 and marketing trends at New York City. The author discusses in the first part of this report the salt-water market receipts; marketing trends; receipts by shipping areas; receipts by species; trends in method of transportation; fresh-water market receipts; and imports of fishery products through the New York customs district. The tables, in the second part of this report, present data on receipts of fish and shellfish in the salt-water section of Fulton Market by months and method of transportation, by species and method of transportation, and by states and provinces of origin.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

"Asdic in the Fishing Industry," by C. M. Good, article, World Fishing, vol. 5, no. 3, March 1956, pp. 26-28, illus., printed. John Trundell Ltd., Temple Chambers, Temple Ave., London, E.C. 4, England. The use of horizontal echo-searching equipment on a commercial basis is still very much in its infancy, and much experimental work remains to be done before there can be any general application. This article discusses some of the problems of adopting Asdic equipment to commercial fishing, gives details of the most desirable beam shape

required for fish finding, and deals with the snags met with through the effects of rolling.

- "The Atlantic Salmon's Comeback," by Anthony Netboy, article, Nature Magazine, vol. 49, no. 1, January 1956, pp. 37-40, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St., N.W., Washington 6, D. C. Includes a brief history of the Atlantic salmon, Salmo salar, a description of their habits, and a discussion of the salmon restoration programs being conducted in the United States and Canada.
- (California) The Marine Fish Catch of California for the Years 1953 and 1954 (with Jack Mackerel and Sardine Yield Per Area from California Waters 1946-47 Through 1954-55), Fish Bulletin No. 102, 99 pp., illus., printed. Marine Fisheries Branch, Department of Fish and Game, Sacramento 14, Calif., 1956. This bulletin includes records of the pounds of fish landed in the different areas of the State of California and their value to the fishermen. It is prepared to meet the numerous requests for such data received throughout the year from members of the fishing industry, harbor commissions, scientists, and persons in other related fields for use in their studies and reports. Although this bulletin carries the title "Marine Fish Catch," small poundages of fresh-water commercial landings are also included.
- The Charles F. Johnson Billfish Investigation,
 Summary of Investigations for the Period Comprising January 1954 through August 1955, by
 Luis Rene Rivas, Progress Report No. 1, 8pp.,
 processed. The Marine Laboratory, University
 of Miami, Coral Gables, Fla., September 1955.
- Convention for the Regulation of the Meshes of Fishing Nets and the Size Limits of Fish-London, April 5, 1946 (Presented by the Secretary of State for Foreign Affairs to Parliament by Command of Her Majesty, March 1956), Cmd. 9704, Treaty Series No. 8 (1956), 16 pp., printed in French and English, 9d.(10 U. S. cents). Her Majesty's Stationery Office, London, England.
- "The Conversion of Herring Stickwater to Solubles. III. Preservative Action of Penicillin G on Salmon Offal Stickwater under Plant Conditions," by W.A. B. Thomson, R. E. E. Jonas, R. A. MacLeod, and D. R. Idler, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, pp. 27-30, illus., printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B.C., Canada.
- (Department of Scientific and Industrial Research)
 Report for the Year 1954-55 (Presented by the
 Lord President of the Council to Parliament by
 Command of Her Majesty, March 1956), Cmd.
 9690, 321 pp., printed, 7s. 6d. (US\$1.05),
 Her Majesty's Stationery Office, London, England. Contains reports, among others, on developments and research work on fish and fishery products, and water pollution research.

- "Down to the Sea--for Fish," by Irwin M. Alperin, article, The New York State Conservationist, vol. 10, no. 4, February-March 1956, pp. 22-27, illus., printed. New York State Conservation Dept., Arcade Bldg., Albany, N. Y. A survey of New York's marine sport fishery tells where the bulk of the fishing took place, how it varied seasonally, and what facilities were available for the sportsmen. It was found that more than 30 species of finfish are taken by anglers along the 600-mile coastline of New York's Marine District. However, only about a half dozen of these make up the real volume of the catch. The most important species include porgy, fluke or summer flounder, sea bass, bluefish, flounder, and blackfish. Other species are taken in numbers and occassionally contribute a considerable part of the catch in selected areas. More than 415,000 boat trips were taken from April through October 1954 to catch some species of fish somewhere in the Marine District. Another 71,000 fishing-days were spent by bank, beach, pier, and jetty fishermen during this same period. In all, about 1,700,000 angler-days were spent in pursuit of marine species by the sport fishermen. It was estimated that the catch of open and charter boats during the 1954 season was over 5,300,000 fish of all species.
- East African Fisheries Research Organization Annual Report, 1954/1955, 46 pp., printed. East African Fisheries Research Organization, Jinja, Uganda, 1955.
- "Ecological Observations on a Locally Limited Red Tide Bloom," by Ilmo Hela, article, <u>Bulletin of Marine Science of the Gulf and Caribbean</u>, vol. 5, no. 4, 1955, pp. 269-291, illus., printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Fla.
- "Effect of Chlortetracycline and Storage Temperatures on the Quality of Shucked Oysters," by J. W. Boyd and H. L. A. Tarr, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, pp. 12-13, printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B.C. Canada.
- "Farm Fish Pond Troubles," by Olan Dillon, article, <u>Louisiana Conservationist</u>, vol. 8, no. 6, March 1956, pp. 8-9, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La.
- The Fecundity of TILAPIA Species, by Rosemary H. Lowe (McConneill), 8 pp., illus., printed. (Reprinted from East African Agricultural Journal, vol. XXI, no. 1, July 1955, pp. 45-52)
 East African Fisheries Research Organization, Jinja, Uganda.
- Federal Aid in Fish and Wildlife Restoration (Annual Reports of the Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1955), 102 pp., illus., printed. Wildlife Management Institute, Wire Bldg., Wash-

- ington 5, D. C., and Sport Fishing Institute, Bond Bldg., Washington 5, D.C. Included, among others, are reports on accomplishments of the fish restoration program; a list of Federal aid in fish restoration projects approved during the 1955 fiscal year and the funds obligated; apportionment of funds to the states and territories for use in fish restoration projects for the fiscal year 1955, pursuant to the Dingell-Johnson Act; and a summary of Federal aid in fish restoration apportionments, obligations, reversions, and balances for the fiscal year 1955. The distinct trend in the Dingell-Johnson program toward more developmental work designed to expand the Nation's basic sport fishery resource is noteworthy. In the early years of the fish restoration program, greatest emphasis was placed on fact-finding activities. This year, for the first time, the amount of funds obligated by the states for physical improvements exceeded that scheduled for research. Because of the over-all increase in the funds available, the increase in on-theground or in-the-water restoration measures has been made without jeopardizing the continued growth of the investigational program.
- Feeding Mechanism of the Cichlid Fish, TILAPIA

 ESCULENTA Graham, by P. H. Greenwood,
 3 pp., illus., printed. (Reprinted from Nature, vol. 172, p. 207, August 1, 1953) East

 African Fisheries Research Organization,
 Jinja, Uganda.
- Fishery Research in East Africa, by R. S. A.
 Beauchamp, 8 pp., printed. (Reprinted from
 The Uganda Journal, vol. 19, no. 2, September 1955, pp. 169-176) East African Fisheries
 Research Organization, Jinja, Uganda.
- Fishery Research in the Lakes of East Africa, by R. S. A. Beauchamp, 5 pp., printed. (Reprinted from East African Agricultural Journal, vol. XIX, no. 4, April 1954, pp. 203-207) East African Fisheries Research Organization, Jinja, Uganda.
- Fishery Research Trawler (First British Trawler with Diesel-Electrical Propulsion), 3 pp., illus., printed. (Reprinted from The Shipping World, pp. 67-69, July 20, 1955; also reprinted from Engineering, pp. 220-221, August 12, 1955) Department of Scientific and Industrial Research, Aberdeen, Scotland. Describes the research trawler, Sir William Hardy, which is specially equipped for investigations into the preservation of fish as food. In addition to the normal facilities for trawling, the equipment provided includes laboratories, an experimental freezing plant, an insulated hold for iced fish, and a liver-oil plant.
- The Fishes of Uganda-I, by P. H. Greenwood, 19 pp., illus., printed. (Reprinted from The Uganda Journal, vol. 19, no. 2, Sept. 1955, pp. 137-155) East African Fisheries Research Organization, Jinja, Uganda.
- (FAO) The Sea and World Food Supplies, by D. B. Finn, FAO Fisheries Papers No. 8, 23 pp.,

- processed. (Reprinted from Nutrition Abstracts and Reviews, vol. 24, pp. 487-496, 1954.)
 Food and Agriculture Organization of the United Nations, Rome, Italy, February 1956. Discusses the state of world food supplies, supplies of food from fisheries, per-capita consumption of fishery products, and the prospect for increase in aquatic food.
- The Food of TILAPIA in East Africa, by G. R. Fish, 7 pp., illus., printed. (Reprinted from The Uganda Journal, vol. 19, no. 1, March 1955, pp. 85-89) East African Fisheries Research Organization, Jinja, Uganda.
- "Golden Harvest of the Sea," by Frank A. Montgomery, Jr., article, The Crown, vol. 45, no. 4, April 1956, pp. 14-15, 22-23, illus., printed. Crown Cork & Seal Co., Inc., P. O. Box 1837, Baltimore 3, Md. A good description of the shrimp fishery along the South Atlantic and Gulf coasts, including method of capture, preparation for market, and various types of research being conducted to improve the fishery. A brief description of the life history of the shrimp is also presented.
- Handbook of Tropical Aquarium Fishes, by Herbert R. Axelrod and Leonard P. Schultz, 719 pp., illus., printed, \$10. McGraw-Hill Publishing Co., New York, N. Y., 1955.
- How to Produce Best Quality Whitefish, 10 pp., illus., processed. Department of Fisheries, Ottawa, Canada, March 1955. This leaflet illustrates photographically good and bad handling and packing practices.
- (ICA) Operations Report, February 24, 1956, FY 1956, Issue No. 1, 57 pp., illus., processed. Office of Statistics and Reports, International Cooperation Adm., Washington 25, D. C.
- Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, vol. 1, no. 1, 204 pp., illus., printed. Faculty of Fisheries and Animal Husbandry, Hiroshima University, Fukuyama, Japan, August 1955. This publication is the first number of the Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, published by the Faculty. The Journal should be issued annually, and is devoted to the study of the sciences of fisheries and animal husbandry.
- "Lake Ontario Lake Trout," by Donald G. Pasko, article, The New York State Conservationist, vol. 10, no. 4, February-March 1956, pp. 16-17, illus., printed. New York State Conservation Dept., Arcade Bildg., Albany, N. Y. The decline of the Lake Ontario lake trout was from the start a problem of an international nature. Annual conferences on Lake Ontario fisheries problems had been held between representatives of New York and Ontario for some years, and in 1953 an international lake trout program was begun. Experimental plantings of young lake trout obtained from fish hatcheries were begun in the fall of 1953, and considering the small numbers of trout planted in relation to

the great size of the lake and the great odds against any of them being accidentally entangled in nets, the number of recoveries is very encouraging and indicates good survival. The growth rate of the trout has also been very good. According to the author, it will take considerably more time and study to get all the information desired on the results of the experimental plantings. However, the friendly spirit of cooperation between the conservation agencies of New York and Ontario and the results achieved to date are hopeful signs that progress is being made towards returning the lake trout to the important position it once held in Lake Ontario.

Life in Fresh Water, by E. S. Brown, 64 pp., illus., printed, \$2.75. Oxford University Press, 114 5th Avenue, New York 11, N. Y. More numerous than the familiar fish, frogs, and tadpoles are the more lowly creatures, such insects as the water-boatman and water beetles, water fleas and tiny mollusks.

The Manufacturing Potential of the North Carolina Commercial Fisheries, by William A. Ellison, 54 pp., processed. N. C. Department of Conservation and Development, Raleigh, N. C. February 15, 1956. A report on the possibilities of developing the processing, packaging, and marketing of fish and shellfish produced in North Carolina. Primary attention in this study was given to source, distribution and amount of raw material; existing methods of manufacture; suitability of fish houses for expansion; equipment in fish houses; retail trade practices governing both packaged fish and shellfish and roundfresh fish; methods of processing in other states; suitability of native raw material for manufacture; abundance and potential abundance of raw material; manufacturing and equipment costs. The author states, that "(1) the North Carolina commercial fisheries offer excellent inherent possibilities for processing, although the possible magnitude of such is relatively small when compared with Maryland, Virginia, some of the Gulf States, and New England. Manufacture, however, even on a somewhat limited scale would substantially raise the income inseveral of the seaboard counties and would have a most pronounced effect on a few; (2) Expansion of processing will depend largely on the so-called deluxe animals to be found among the crustacea and mollusks. Finfish offer some, but only limited and occasional possibilities; and extensive manufacture of fish would have to be done in conjunction with other commodities which would carry plant burden and afford a steady labor supply; (3) Processing of shrimp in frozen breaded, peeled and shelled, and split-shell consumer packages offer an immediate and promising opportunity; (4) The expansion of crab meat manufacture is favored by natural abundance and quality, but any extension of this industrial unit will heavily rest on the development of a greater market by the producer; (5) Inherently the oyster offers an excellent opportunity. Until the supply is stabilized at a level higher than it is today, there appears no possibility that this unit of the fisheries willflourish beyond its present somewhat sickly stage; (6)

The quality of North Carolina seafood is excellent, unsurpassed by that of any state; and its freshness, particularly in regard to shrimp, offers any processor a merchandizing lever of great strength; and (7) The ultimate position of North Carolina in the seafood industry of the nation will largely depend upon the development of a merchandising system on the part of the industry."

The Marine Laboratory Prospectus, no. 55-32, 37 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., December 1955.

"Marine Mammals," by E. Laurence Palmer, article, Nature Magazine, vol. 49, no. 1, January 1956, pp. 25-32, illus., printed, single copy 50 cents. American Nature Association, 1214-16th St., N. W., Washington 6, D. C. Presents a list of the marine mammals, with the common name, scientific name, description, range and relationship, reproduction, ecology, and economic aspects of these animals of the sea.

"Marine Science in the Pacific Area," by G. E. R. Deacon, article, Nature, vol. 177, no. 4504, February 25, 1956, pp. 353-355, printed. MacMillan & Co., Ltd., St. Martin's St., London, W.C.2, England (also St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.) Because of the growing needs of marine research the United Nations Educational, Scientific and Cultural Organization nominated an Interim Advisory Committee. The Committee held its first meeting in Tokyo during October 1955 and started with a general discussion of trends and progress in marine research. The author outlines some of the main features of this meeting and discusses in particular marine science in Japan. He states, that "The fisheries research (in Japan) is aimed primarily at finding and improving the exploitation of fishing grounds and attempting to foresee fluctuations in distribution and numbers of mackerel, sardine, squid, herring, salmon, skipjack, tunas, and whales. The work includes extensive ecological surveys of spawning and nursery grounds, and detailed studies to improve the understanding of variations in the principal currents, particularly the Kuroshio and Oyashio, It includes research cruises to the Bering Sea and more than half-way across the Pacific Ocean. As in other countries, there is no obvious or logical division between the basic and applied research; but there seems to be a tendency for the initiative in the basic work to be with the universities, though they do not lack active collaboration from the government and regional laboratories devoted to hydrographic, meteorological and fisheries research.

The Master Diver and Underwater Sportsman, by
T. A. Hampton, 208 pp., illus., printed, \$5.
John de Graff, Inc., 64 W. 23rd St., New York
10, N. Y. A diving manual giving instruction
in diving, protective clothing, underwater
cutting and welding, blasting and seamanship.

- Movements of Salmon and Sea Trout, Chiefly Kelts, and of Brown Trout Tagged in the Tweed between January and May 1937 and 1938, by G. Herbert Nall, Freshwater and Salmon Fisheries Research Series no. 10, 19 pp., printed. H. M. Stationery Office, Edinburgh, Scotland, 1955.
- Navigation Dictionary, H. O. Pub. No. 220, 256 pp., printed, \$2. U. S. Navy Hydrographic Office, Washington, D. C., 1956. (For sale by authorized Sales Agents of the U. S. Navy Hydrographic Office; also by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) The need for a comprehensive, authoritative dictionary of navigational terms has been widely recognized. The purpose of this volume is to supply that need by furnishing the navigator of any type craft with definitions that represent present usage.
- Operation of the Trade Agreements Program, Eighth Report, July 1954-June 1955, 321 pp., processed. United States Tariff Commission, Washington 25, D. C., 1956.

This report discusses changes made in United States trade agreements legislation by the Trade Agreements Extension Act of 1955. It covers important developments, in the last half of 1954 and the first half of 1955, respecting the General Agreement on Tariffs and Trade, including the review of the General Agreement conducted by the contracting parties at their Ninth Session; and it discusses the proposed Organization for Trade Cooperation. It analyzes the United States trade-agreement negotiations that were conducted with Japan and other countries during this period. Like the earlier reports in the series, the eighth report also discusses such matters as the actions of the United States relating to its trade agreements program; changes in tariffs, exchange controls, and quantitative restrictions on imports by contracting parties to the General Agreement; and changes in tariffs, exchange controls, and quantitative restrictions on imports by countries with which the United States has bilateral trade agreements.

- Peces de Importancia Comercial en la Costa Nor-Occidental de Mexico (Fishes of Commercial Importance on the Northwest Coast of Mexico), by Julio Berdegue A., 350 pp., illus., printed, in Mexican. Secretaria de Marina, Direccion General de Pesca, Comision para el Fomento de la Piscicultura Rural, Mexico D. F., 1956.
- La Pesca en el Lago de Patzcuaro, Michoacan, y su Importancia Economica Regional (The Fish in Lake Patzcuaro, Michoacan, and Their Regional Economic Importance), by Aurelio Solorzano Preciado, 59 pp.; illus., printed, in Mexican. Secretaria de Marina, Direccion General de Pesca, Comision para el Fomento de la Piscicultura Rural, Mexico D. F., 1955.
- (Rapports et Proces-Verbaux des Reunions) Report on Echo-Sounding and Asdic for Fishing Purposes, vol. CXXXIX, edited by W. C.

- Hodgson and A. Fridriksson, 51 pp., illus., printed, Kr. 12 (US\$1.74). Conseil Permanent International Pour L'Exploration de la Mer International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, September 1955. Presents the results of a survey begun in 1950 to collect as much information as possible concerning the problems of echosounding as an aid to commercial fishing. This survey showed that asdics are only used in whaling and have as yet no place in other commercial fisheries although horizontal echosounding has recently been introduced to the Norwegian herring industry. This report contains a history of echo-sounding development: principles of echo-sounding; identification of echo-traces; applications of echo-soundings; state of echo-sounding in various countries; and suggestions to manufacturers. Appendixes include two articles: "A Proposal for the Introduction of Organized Echo-Search in North Sea Herring Investigations, " by B. B. Parrish; and "The Use of Echo-Sounder in Fish-Location--A Survey of Present Knowledge, with Notes on the Use of Asdic," by R. E. Craig.
- "Red Tide and the Fluctuation of Conservative Concentrations at an Estuary Mouth," by Frank Chew, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 5, no. 4, 1955, pp. 321-330, illus., printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Fla.
- Salmon and Steelhead Fishing Map, 2 pp., folder, illus., printed. Department of Fish and Game, 926 Jay St., Sacramento 14, Calif. A description of the California salmon and steelheadfishery and what is necessary to maintain it. Includes description of the species of salmon and trout found in California waters, brief comments on the main California river systems, and conservation problems.
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- Species of TILAPIA in East African Dams, with a Key for Their Identification, by Rosemary H. Lowe (McConnell), 7 pp., illus., printed. (Reprinted from East African Agricultural Journal, vol. XX, no. 4, April 1955, pp. 256-262) East African Fisheries Research Organization, Jinja, Uganda.
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--A. W. Anderson

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- Der Walfang der Gegenwart (Present Day Whaling), by Dr. Kurt Schubert, 214 pp., illus., printed, DM 60. From Handbuch der Seefischerei Nordeuropas (Handbook of the Sea Fisheries of Northern Europe), Bd. XI, H. 6 (vol. XI, no. 6). E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, W. Germany, 1955. A treatise dealing with the many aspects of the whaling industry. It covers the life history of the whale, gear and equipment used in the catching of whales, and the processing of the products obtained from the whale.
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